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ABSTRACT

This document proposes a revision of the Carnegie Classification of Higher Education Institutions in its classification of Associate of Arts colleges with reliance on readily available data. Based on the findings of a nationwide study of community college curriculum, the document outlines a new classification system developed according to curricular characteristics and their association with other institutional characteristics. The paper reviews and tests thirteen different classification models for accuracy in classifying community colleges, including the following characteristics as proxies for the percentage of the curriculum in liberal arts: institutional size, the percentage of English courses in the curriculum, and the percentage of expenditures devoted to instruction. Findings from these tests show that the most accurate classification system is based on the percentage of English course offerings. The emerging classification system is comprised of the following six categories: (1) small, occupational colleges; (2) small, liberal arts colleges; (3) medium, occupational colleges; (4) medium, liberal arts colleges; (5) large, occupational colleges; (6) large, liberal arts colleges. However, using readily available data, institutional size provides the most accurate classification of colleges. In this classification scheme, only two categories emerge: (1) large, liberal arts colleges; and (2) medium and small colleges of mixed curricular emphases. (Contains 35 references.) (KS)

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UNIVERSITY OF CALIFORNIA

Los Angeles

# A Curriculum-Based Classification System for Community Colleges

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in Education

by

Gwyer Lenn Schuyler

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2000



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IN DEDICATION

To the two people who have provided me unending support in this endeavor,

my mentor, Arthur M. Cohen, and

my husband, Phillip D. Simon.

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ABSTRACT OF THE DISSERTATION

A Curriculum-Based Classification System for Community Colleges

by

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Doctor of Philosophy in Education

University of California, Los Angeles, 1999

Professor Arthur M. Cohen, Chair

The curriculum does not equivocate. The community college curriculum is an accurate representation of student course-taking behavior and the mix of courses offered is an incontestable depiction of the purpose of the college. This dissertation proposes a revision of the Carnegie Classification of Higher Education Institutions in its classification of Associate of Arts colleges. The proposed system is based on curricular characteristics and their association with other institutional characteristics. The underlying theory of classification, including how categories are designed and used, is

discussed and an analysis of historic and contemporary trends in the community college curriculum is presented to ascertain a method by which curriculum characteristics can be used to classify two-year colleges. To this end, the characteristic of the percentage of liberal arts that makes up the college curriculum is established as a stable characteristic over time. By considering the relationships between the percentage of liberal arts in the curriculum and other characteristics that are routinely measured by the National Center for Education Statistics, a viable and meaningful classification model is proposed with readily available data acting as proxies.

Thirteen different classification models are tested for accuracy in classifying colleges, including the following characteristics as proxies for the percentage of the curriculum in the liberal arts: institutional size, the percentage of English courses in the curriculum, and the percentage of expenditures devoted to instruction. Findings from these tests show that the most accurate classification system is based on the percentage of course offerings that were in English. This system is comprised of six categories -- (1) Small, Occupational Colleges; (2) Small, Liberal Arts Colleges; (3) Medium, Occupational Colleges; (4) Medium, Liberal Arts Colleges; (5) Large, Occupational Colleges; and (6) Large, Liberal Arts Colleges. However, when readily available data are used, institutional size provides the most accurate classification of colleges. In this classification scheme, only two categories emerge -- (1) Large, Liberal Arts Colleges, and (2) Medium and Small Colleges of Mixed Curricular Emphases. The paper concludes with a discussion of the classification of community colleges, including both theoretical and practical implications.

A Curriculum-Based Classification System for Community Colleges

## Chapter 1: Introduction

The community college is a unique institution in the American system of higher education. Fundamentally, its curriculum is the source of that uniqueness. The community college curriculum includes such diverse areas of study as general education, vocational education, and remedial or developmental education. These areas of the curriculum are in direct response to three distinct goals of students: preparation for transfer to four-year institutions, education for employment, and improvement of basic skills not mastered in high school. Throughout its history, the community college has maintained a curricular mission of responsiveness to changing patterns in student aspirations and in the local economy. This level of responsiveness exclusively characterizes the community college and may be viewed as its greatest strength.

The community colleges of the United States enroll close to 50 percent of all the students who begin higher education. As such, what happens there affects the course of study, the progress, and the nature of learning for nearly half of all postsecondary students. Both because of the number of students it serves and its unique responsiveness, studying the community college curriculum is an important and worthwhile endeavor. To this end, the purpose of this dissertation will be to understand the historical and contemporary trends in the community college curriculum and to propose a means of classifying community colleges based on distinctive curriculum characteristics.

## Chapter 2: The Problem of Categorizing Community Colleges: The Need for Revision

Since 1970, the Carnegie Foundation for the Advancement of Teaching has categorized US colleges and universities. Prior to that time, no systematic means of classifying colleges was used in the United States. While there may have been a loose classification of institutions as "universities" versus "colleges" – where universities offered advanced degrees and colleges focused on undergraduate education – even that gross distinction was not firm. At the beginning of the 20th century, however, the institution of junior college emerged, and this category has remained distinct. Nonetheless, a comprehensive classification of higher education institutions was not implemented until the Carnegie Foundation's system was developed.

Little information could be gained by following the examples of classification systems from other countries. In the past and in the present, other countries have not employed comprehensive classification systems of higher education institutions, or if they have, there has been little need to develop elaborate systems with multiple categories. The United States is unique in the number and variety of institutions because the United States lacks a central coordinating agency. Thus, institutions are able to be more free-form and less clearly defined in their purposes. Other countries may either have fewer types of institutions or they may have several types of institutions that have their purposes clearly defined by centralized coordinating agencies. Based on information out of UNESCO (United Nations Educational, Scientific and Cultural Organization) (1997), some examples of categories of institutions from other countries are reported below.

| | |
|---|---|
| Germany: | 1. University<br>2. Technical University<br>3. Teacher Training College<br>4. College of Art/College of Music<br>5. Higher Education Institute (Engineering, Economic, Administration, Agriculture) |
| Canada: | 1. University<br>2. Community College<br>3. Private Vocational College<br>4. College D'enseignement General Et Professionnel<br>5. College of Applied Arts and Technology<br>6. Other Specialized Institutions |
| United Kingdom: | 1. University<br>2. Open University<br>3. College and Institution of Higher Education<br>4. Open College<br>5. College of Technology<br>6. Teacher Training College<br>7. Institute |
| Japan: | 1. University<br>2. Junior College<br>3. College of Technology |
| Australia: | 1. University<br>2. College of Advanced Education (CAE)<br>3. Technical and Further Education (TAFE) College |

A major difference between institutional classification in the United States versus those in other countries is that in other countries, the categories of institutions are established de facto by centralized coordinating agencies. On the contrary, in the United

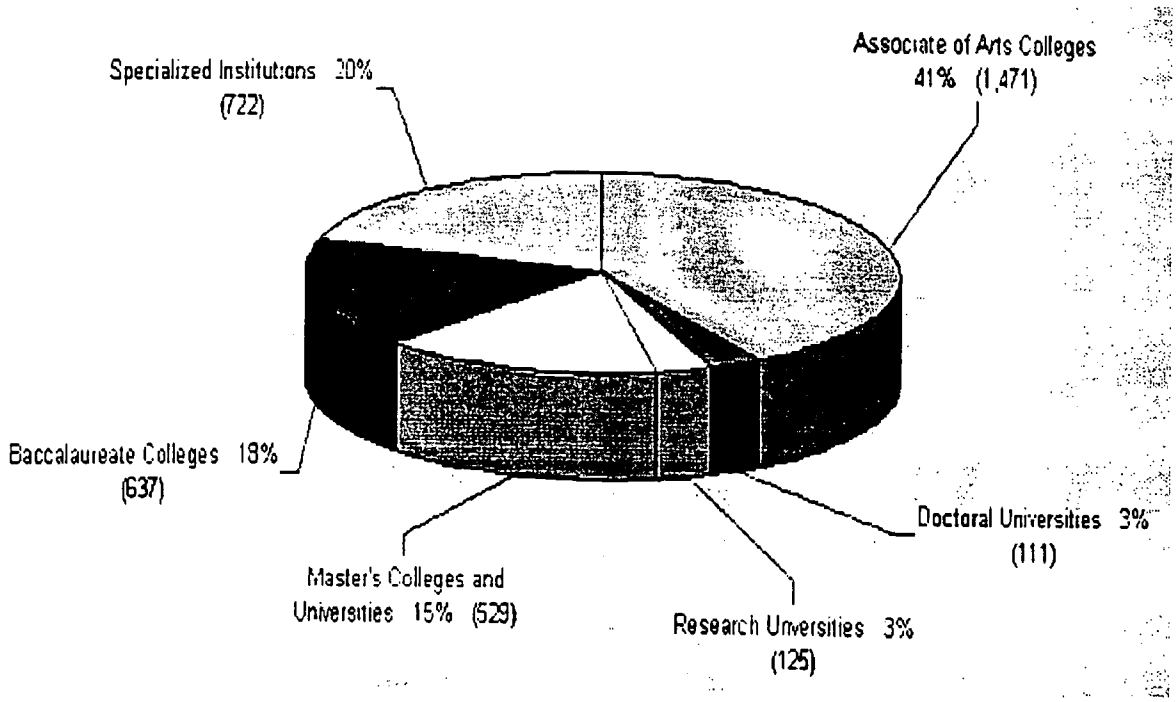
States, categories are created to best fit the institutions that are in existence. In other words, the difference is whether the category or the institution comes first.

Unlike the situation found in other countries, the Carnegie Foundation sought to design a classification system on like-characteristics among the wide array of existing institutions. The original aim of the Carnegie Classification was to "cluster institutions with similar programs and purposes" (p. 1). In the design of the Carnegie Classification, the Foundation staff was looking for larger patterns within institutional types. The driving force behind Carnegie's efforts to classify was to improve the precision of the organization's research. Periodically, in 1973, 1976, 1987, and 1994, changes were made in the categorization system to better reflect the diversity of institutions. For example, in 1994, the category, Tribal Colleges, was newly created.

Figure 1 and Table 1 show the universe of 3,595 degree-granting institutions by Carnegie categories. In total, Doctorate-granting institutions make up 6.6 percent, Master's-granting institutions make up 14.7 percent, and Baccalaureate-granting institutions make up 17.7 percent of all institutions respectively. Each of these broad categories is broken down into at least two narrower subcategories, based on such distinguishing characteristics as the amount of funding received from the federal government, the degree of selectivity in admissions, and the number of different disciplinary degrees offered. While the main organizing principle is the highest degree offered, the classification system is fine-tuned in these three main categories by other distinguishing institutional aspects.

Unlike the Doctorate-, Master's- and Baccalaureate-granting institutional categories, however, the Associate of Arts college category is not further broken down into subcategories. Although there are 1,471 Associate of Arts colleges, comprising 41 percent, the largest percentage of the universe of higher education, Carnegie has made no distinctions between institutions within this category.

Figure 1. Universe of Institutions by Carnegie Classification, 1994




Source: The Carnegie Foundation for the Advancement of Teaching, 1994

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Table 1. Number of Higher Education Institutions by Type and Control: 1994

| Carnegie Classification | Number of Institutions | Percentage of All Institutions (N=3,595) |
|---|---|---|
| Doctorate-Granting Institutions | 236 | 6.6 |
| Research Universities I | 88 | 2.5 |
| Research Universities II | 37 | 3.0 |
| Doctoral Universities I | 51 | 1.4 |
| Doctoral Universities II | 60 | 1.7 |
| Master's Colleges and Universities | 529 | 14.7 |
| Master's (Comprehensive Universities & Colleges I) | 435 | 12.1 |
| Master's (Comprehensive Universities & Colleges II) | 26 | 2.6 |
| Baccalaureate Colleges | 637 | 17.7 |
| Baccalaureate (Liberal Arts) Colleges I | 166 | 4.6 |
| Baccalaureate Colleges II | 471 | 13.1 |
| Associate of Arts Colleges | 1,471 | 40.9 |
| Specialized Institutions | 693 | 19.3 |
| Tribal Colleges and Universities | 29 | 0.8 |

Source: The Carnegie Foundation for the Advancement of Teaching (1994)

Recently, the Carnegie Foundation has announced that it is undergoing another round of revisions of its classification system (Lively, 1999). The proposed revisions would affect research and doctoral universities and baccalaureate colleges. These proposed revisions may be in response to criticisms that the classification system reinforces a hierarchy among institutions, promoting a "tournament mentality" (Lively, 1999, p. 1). Carnegie scholars have recognized and spoken out about the unconstructive

application of the classification system to confer status or rank institutions (McCormick, 1999). The revision was proposed partly in the hope that institutions would be less inclined to set their institutional agendas based on how their classification would be affected, thus reducing the degree that the classification would stand for a measure of status or rank.

This line of critique -- that the Carnegie Classification functions as a hierarchy of prestige -- is significant in the discussion of the classification of community colleges, because in terms of status and rank, community colleges are found at the bottom. One factor that contributes to this state of affairs may be the lack of attention to this category as reflected in the lack of divisions within the category. Even in this last round of proposed revisions, however, no divisions have been called for.

Still, those who study community colleges know that not all community colleges are made alike. In fact, one of the greatest ironies of this classification system is that community colleges probably embody the greatest variation from college to college of any higher education institutional type. This high degree of variation may partly explain the difficulty in coming up with subcategories into which the Associate of Arts colleges can be divided.

## Chapter 3: The Universe of Associate of Arts Colleges

Several possible approaches to subcategorizing Associate of Arts Colleges deserve consideration. According to the NCES report, *Current Funds Revenues and Expenditures of Degree-Granting Institutions: Fiscal Year 1996*, publicly-controlled colleges make up over 85 percent of the total 1,261 not-for-profit Associate of Arts colleges[1]. This being the case, a natural categorization emerges, dividing publicly and privately supported Associate of Arts colleges. However, in the classification of Doctorate-, Masters-, and Baccalaureate-granting institutions, a similar division between publicly- and privately-controlled institutions is not made. Thus, because of the small number of private Associate of Arts colleges and because the current Carnegie Classification does not distinguish between public and private institutions, this study will focus only on public Associate of Arts colleges, which make up the vast majority of all Associate of Arts colleges.

Taking cue from the existing subcategories of Doctorate-, Master's-, and Baccalaureate-granting institutions, consideration must be given to whether similar distinctions could be applied to Associate of Arts colleges.

Can Associate of Arts colleges be distinguished from each other by the amount of funding received from the federal government? Overall, Associate of Arts colleges receive approximately 5.5 percent of total current funds revenue from the federal

[1] The major distinction between public and private two-year colleges is the percentage of total funds revenue that is received from tuition and fees versus from state and local appropriations. Public colleges receive 21.1 percent of their revenue from tuition and fees and 62.2 percent from state and local appropriations; whereas private colleges receive 61.5 percent of their revenue from tuition and fees and 4.1 percent from state and local appropriations (National Center for Education Statistics, 1999, Tables 3 and 5).

government, 87 percent of which is in the form of restricted grants and contracts (National Center for Education Statistics, 1999, Table 1). This large proportion of the revenue from restricted grants and contracts implies that federal support of community colleges is limited to specific programs and projects. Thus, federal support represents such a small percentage of total funds revenue that it would not be a strong institutional characteristic by which to subcategorize these colleges.

Can Associate of Arts colleges be distinguished by the degree of selectivity in admissions? This possibility is an easy one to eliminate because most Associate of Arts colleges are nonselective, allowing attendance to anyone who is at least 18 years of age and who can benefit from the educational experiences at the college. Associate of Arts colleges cannot be distinguished based on who is admitted into the institution.

Can Associate of Arts colleges be distinguished by the number of different disciplinary degrees offered? In the Doctorate-granting institutional classification, the distinction is made between institutions that award 20 or more doctorate degrees in one or more disciplines and those that award at least 40 doctorate degrees in five or more disciplines. For Master's-granting institutions, the distinction is similarly made at the master's degree level. At the baccalaureate level, the distinction is made between colleges that award less than and more than 40 percent of their baccalaureate degrees in liberal arts fields. Would either categorization approach -- that used in the case of Doctorate- and Master's-granting institutions or that used in the case of Baccalaureate-granting institutions -- work in categorizing Associate of Arts colleges?

Two-year colleges offer a broad range of disciplinary degrees, most of them within the categories, Associate of Arts, Associate of Science, and Associate of Applied Arts or Applied Sciences. They also offer certificates and short-term training in many occupational fields, not to mention basic skills education in fundamental disciplines such as English and Mathematics. In light of the range of services provided by two-year colleges, it would be possible to consider how many Associate degrees a two-year college awards and how many different disciplines or fields they award them in, but it would be unmistakably misguided. This approach is simply not in line with the actual mission of this institutional type. By linking categorization of institutions solely to the number of degrees awarded in given disciplines, the classification would be incongruous with the purpose of the two-year college which is much more far-reaching than simply awarding Associate degrees. In fact, the purpose of awarding Associate degrees may arguably be one of the less important purposes of the two-year college because the degree itself is not a sought-after certification by students or employers. The data support these contentions: 1) nearly half the first-time-in-college students who enter community colleges fail to complete four courses at that institution within four years; and 2) the colleges enroll more than 5.5 million students but award fewer than 450,000 associate degrees per year.

Having eliminated the application of the distinctions used in the subcategories of Doctorate-, Master's-, and Baccalaureate-granting institutional types, the task is to consider the unique characteristics of two-year colleges that might be used as classifying criteria. One possibility -- and one that has been considered in the past by the Carnegie Foundation -- is classifying colleges based on the academic intentions of college students.

The reasoning behind this approach as opposed to basing college classification on the number of degrees awarded is that students may enter a college intending to get an Associate's degree in a given discipline, may stop out once or several times or may take courses on an occasional basis as a part-time student. The student may ultimately achieve the degree, yet the period of time might be drawn out by years. Also, relatively few matriculants ever complete the degree; indeed, many of them have other degrees already.

By classifying colleges by what their students' intentions were upon enrolling, then the college would be more accurately classified by the purposes for which students are using the college. In this approach, the participation of those students who choose to take alternative, often tangential, paths to the accomplishment of a goal is not overlooked. This sounds like a very plausible means of categorization, and seems to be more in line with the colleges' mission of responsiveness to the goals of students. One must ask, however, whether students' intentions are a good means of measuring how students actually make use of the college. In other words, are students' intentions strong predictors of the students' course-taking patterns or eventual accomplishment of the initial goal?

Studies of this very issue have found that the answer is no. For example, Palmer (1987) has found that students' actual course-taking behavior does not naturally follow from their intentions. Initially, students might have aspirations to prepare to transfer to a four-year institution, however for whatever reason, they may instead take terminal, occupational courses leading to direct employment. This is but one example of how students may enter two-year colleges with one plan but go on to take courses that do not

match that original plan. Moreover, student intentions as identified by surveys may not be reliable, yielding different answers when students are asked at different times and in different ways. All in all, because students' intentions may not be accurate reflections of what students actually do once they are at a two-year college, using students' intentions to classify colleges could be misleading and uninformative.

Another factor that must be considered when designing a classification system is the availability of data or information on the colleges to be classified. In order for a classification system to be useful, it must be based on readily available information. If categories are designed around characteristics that are not measured in some systematic way, the categories would not be reliable.

In summary, the problem remains to design a practical and meaningful way to classify community colleges. To address this problem, more information is needed about designing categories, about the system of higher education, and about specific characteristics of community colleges.

## Chapter 4: Literature Review

As background for the present study, the theory of categorization is reviewed and the limitations of classical conceptions of categories are explored. A realistic representation of categorization is then established and considered as applied to higher education. The present system of categorization of higher education, the Carnegie Classification, is presented and the results of previous studies of the community college curriculum are examined.

### The Meaning and Purpose of Categorization

What is categorization? Why do we strive to make categories? This section will present a theoretical discussion of the meaning and purpose of categorization in general, and what the desire to categorize reveals about our cognitive functioning. The work of George Lakoff will be central to this discussion. Specifically related to this project, the meaning and purpose of categorization as it applies to higher education institutions, curriculum, and students will be explored, and a theoretical analysis of *The Carnegie Classification of Higher Education* will be conducted.

Intuitively, we all know what categorization means -- it is the process of defining groups of live or inanimate objects based on commonalities within groups. That is common sense. The purpose of categorization also seems blatantly clear -- at the most basic level, the purpose of categorization is to organize or make sense of one's environment. By categorizing, we can save ourselves time from learning about each and every thing. Instead, we only need to learn about the category that that thing falls into.

Thus, categorization is a time-saving tool, possibly even a cognitive strategy that humans have evolved in order to survive.

George Lakoff (1987), the pre-eminent thinker about the theory of categorization, summarizes how central categorization is to human survival and understanding:

> Without the ability to categorize, we could not function at all, either in the physical world or in our social and intellectual lives. An understanding of how we categorize is central to any understandng of how we think and how we function, and therefore central to an understanding of what makes us human (p. 6).

Lakoff goes on to describe how most categorization is automatic, without conscious thought. The process of categorizing the world is so inherent to how we as humans function that we are not even aware we are doing it most of the time.

Theoretical understanding of categorization, however, is evolving. While the common-sense definition of categorization as presented above has dominated Western thinking in the form of classical theory, newer questions have been asked that expose shortcomings in this common-sense theory. It turns out that the process of categorization may be much more complex than simply the identification of shared qualities among entities.

Recent work that dives beneath the common sense of categorization shows a complex process of cognitive functioning that is influenced by intricate perceptions, not simply straightforward observation. While the history of categorization theory is beyond the scope of this paper, a discussion of these recent developments in the understanding of

categorization will be presented. In particular, the concepts of what Lakoff and others have labeled prototype effects and idealized cognitive models (ICM) will be introduced.

The Limitations of Classical Theory

Below is an illustration of the classical theory of categorization. This simple model represents different categories in different boxes.

Figure 2. Illustration of the classical theory of categorization

In each box, the objects are identical to each other. There is no trouble recognizing the sameness of these objects. However, the limitation of this simple categorization system is that it cannot be applied to the natural world. No objects, whether they are live or inanimate, are exactly the same. Rather, sameness is relative. Moreover, each object is in a unique position in relation to every other object. Therefore, in the natural world, the cognitive processes of categorization must somehow account for the nuances of differences among objects to be categorized in a more complex categorization process.

The Real World: Fuzziness and Non-Rigid Boundaries

Unlike the depiction above, most real-life categories are fuzzy or have non-rigid boundaries. For example, when the qualities by which objects are categorized are themselves based on gradations or could involve different degrees, then the category is a fuzzy one with flexible boundaries. An instance of such a fuzzy category would be one based on a quality like tallness or richness (Lakoff, 1984). Membership in that category is not determined by a specific quality, but rather a degree of a quality. Fuzzy categories result in non-rigid boundaries which are open to interpretation.

Prototype Effects and Basic-Level Effects

In the study of classification, it is a commonly held opinion that the pioneer in the critique of classic categorization theory is Eleanor Rosch (Lakoff, 1987; Frumkina & Mikhejev, 1996). In the 1970s, Rosch was the first to research and document that certain members in a category may be perceived as better representations of that category than others (Rosch, 1973; 1975a; 1975b; 1977, 1978). Following from this, Rosch termed the concept of 'prototype' as the member of a category that is the best example of that category (Rosch, 1981). One example of a prototype effect from her work is related to the category, *bird.* Robins were judged by experimental subjects as more representative of the category *bird* than chickens, penguins, and ostriches (Rosch, 1981; Lakoff, 1987).

The example of the *bird* category suggests an internal structure within the category. This is not a case of fuzziness or non-rigid boundaries; birds fall within a well-defined category, yet degree of membership exists within the category itself. Lakoff

(1987) explains that the ability to judge goodness-of-fit of an object within a category points to a complex cognitive understanding of the category.

Another area of Rosch's work addresses taxonomic hierarchies. With her associates, Rosch concluded that cognitively, the most basic level within a taxonomy is the middle (Rosch, Simpson, and Miller, 1976). The middle level category is the level that is most commonly used in knowledge organization. Lakoff (1987, p. 46) gives the following examples:

| | | |
|---|---|---|
| SUPERORDINATE | ANIMAL | FURNITURE |
| BASIC LEVEL | DOG | CHAIR |
| SUBORDINATE | RETRIEVER | ROCKER |

The basic level is the level of category that is most commonly used to identify category members. It has enough detail -- but not too much! -- to describe the general characteristics of category members. This basic-level structure is not based on objectivity, but rather on what Lakoff calls *clusters of interactional properties*. In other words, the basic level is determined by the way that people interact with, perceive, organize information around, and behave toward the categories.

Along with taxonomic hierarchies as those described above, most categories themselves occur within systems of contrasting categories. Lakoff (1987) emphasizes that any one category largely depends on the nature of the system and on the other categories within the system. He illustrates this point with the following example:

> Within the superordinate category of things-to-sit-on, *chair* contrasts with *stool*, *sofa*, *bench*, etc. *Chair* would no doubt cover a very different range if one of the contrasting categories, say, *stool* or *sofa*, were not present (p. 52).

Idealized Cognitive Models

Lakoff's (1987) original work expands on Rosch's with the introduction of his concept, *idealized cognitive models* (ICM). As this label suggests, ICMs are idealized structures that can inform conceptual categories. Explaining by example, Lakoff shows how the word *bachelor* -- which is typically defined as an unmarried adult man -- defines a category which is derived from an ICM of a society that holds heterosexual marriage of adults as the norm. When it comes to categorizing people outside of this ICM, Lakoff highlights the limitations of the *bachelor* category. Adult men who are homosexual, who are in unmarried relationships, or who are priests, simply fall outside of the definition of a *bachelor*.

From the *bachelor* example, it is clear that ICMs fit one's understanding of the world to varying degrees. While the category of *bachelor* is not a graded one -- meaning members are not more or less bachelors as they may be more or less tall or rich -- the category is subject to a gradation as to the degree to which the underlying ICM fits with one's knowledge about the world (Lakoff, 1987, p. 71). Lakoff poses that what results is a kind of prototype effect based on the goodness-of-fit of category members to the ICM.

In sum, the cognitive process of categorization is not a simple one as depicted in classical theory. Instead, categories have fuzzy, non-rigid boundaries and are defined by

internal and external structures of perceptions and judgments. Prototype effects are at work as individuals judge the goodness-of-fit of members in a category. Basic level effects are also at work in terms of the level of category most commonly referenced. Moreover, the influence of the system of categorization on the structure of individual categories cannot be understated. In addition, categories may grow out of idealized cognitive models (ICMs), which have variable levels of fit with one's experience of the world. With this deeper understanding of what contributes to the shaping of a category, the remainder of this chapter will be an attempt to apply this understanding to the categorization of higher education institutions.

## The Categorization of Higher Education

Categories abound in higher education. Distinctions are fine, and often not based on fact. Many distinctions in categories are relics from the past. Tradition in higher education remains as one of the greatest forces shaping categorization, especially in the face of great innovation. At the most general level, the category, *higher education*, itself is shaped by tradition. Another category, *postsecondary education*, overlaps with the category of *higher education*, yet *higher education* is more exclusive. The *higher education* category includes those institutions that honor the tradition of American colleges and universities, whereas the category, *postsecondary education*, includes any education beyond the secondary level, including basic training.

Prototype and Basic Level Effects and Idealized Cognitive Models in Higher Education

Higher education in this country has become something much more than an academic education. It has become a right of passage. In order for children to pass into the category of *adulthood*, higher education provides an organized, formal institution in which to do so. The tradition of sending children off to college to be trained in the ways of society goes back to the earliest colonial colleges. Because of this long tradition, a kind of idealized cognitive model (ICM) of what higher education should be has been collectively formed in this society. Similarly, when one thinks of the category, *institutions of higher education*, an idealized representation or prototype of college likely forms in the image of the liberal arts colleges that were this country's pioneering higher education institutions or the flagship universities that garner public attention because of research conducted there. At minimum, when one thinks of the category, *institution of higher education*, many people would think of a four-year degree-granting institution with a campus made up of buildings with classrooms and offices.

| | |
|---|---|
| SUPERORDINATE | HIGHER EDUCATION |
| BASIC LEVEL | PROTOTYPE COLLEGE |
| SUBORDINATE | COMMUNITY COLLEGE |

The college prototype described above could be called the *basic level category* of higher education. It is what many people would think of when they think of higher

education. Community college, at a subordinate level, is most likely not the category in which one's impressions of college are organized.

In effect, the ICM of the prototype college encompasses what college should look like, who should attend college, what the college experience should be like, and what the purpose of college should be. This ICM is largely the basis for organizing the categorization of higher education institutions.

The Categorization of the Curriculum

Just as the ICM greatly influences the categorization of higher education institutions, it also is supreme in the categorization of the curriculum. The curriculum in higher education is always growing. New courses are frequently added to institutional course offerings, but rarely are areas of the curriculum eliminated. The traditional academic disciplines of the category, *liberal arts*, maintain a position of stature in the ICM. The college prototype is an institution that graduates students who are learned in this so-called classic knowledge. Some have challenged the ICM and the classic knowledge that it prescribes for students. In fact, the contemporary movements heralding multiculturalism or postmodernism are based on tenets that undermine the centrality of classic knowledge. While heated debates engulf academe on a regular basis about the significance and value of the liberal arts and the classics, the prototypical image of a college education has stubbornly endured.

Mapping the Categories of Higher Education

In Lakoff's (1987) work, he analyzes a universal classifier system of an Australian aboriginal people, the Dyirbal. He maps the internal structure of language categories, showing the following characteristics:

- A base model that describes the number of categories;
- A specification of central subcategories within categories;
- A basic opposition model, or designation as to whether categories oppose each other;
- An explanation of chaining principles, or the principles around which the categories are formed; and
- A list of exceptions.

Following Lakoff's approach, the categorization system of higher education as designed by the Carnegie Foundation for the Advancement of Teaching is mapped and analyzed below. First, however, the full-text definitions and accompanying notes of the *Carnegie Classification* are presented.

The Carnegie Classification

The Carnegie Foundation for the Advancement of Teaching has been responsible for the design of the primary system of classification of higher education institutions since 1970. Prior to this, no unified system of classification existed. In the publication, *The Carnegie Classification of Higher Education* (1994), degree-granting institutions are classified into ten different categories. These categories, according to Ernest L. Boyer in

the Foreword of the book, are defined, among other characteristics, by the highest level of degree conferred by an institution. The following is a listing of the institutional categories, excerpted from *The Carnegie Classification of Higher Education,* along with accompanying footnotes:

**Research Universities I**: These institutions offer a full range of baccalaureate programs, are committed to graduate education through the doctorate, and give high priority to research. They award 50 or more doctoral degrees[1] each year. In addition, they receive annually $40 million or more in federal support.[2]

**Research Universities II**: These institutions offer a full range of baccalaureate programs, are committed to graduate education through the doctorate, and give high priority to research. They award 50 or more doctoral degrees[1] each year. In addition, they receive annually between $15.5 million and $40 million in federal support.[2]

**Doctoral Universities I**: These institutions offer a full range of baccalaureate programs and are committed to graduate education through the doctorate. They award at least 40 doctoral degrees[1] annually in five or more disciplines.[3]

**Doctoral Universities II**: These institutions offer a full range of baccalaureate programs and are committed to graduate education through the doctorate. They

award annually at least ten doctoral degrees—in three or more disciplines—or 20 or more doctoral degrees in one or more disciplines.[3]

**Master's (Comprehensive) Universities and Colleges I**: These institutions offer a full range of baccalaureate programs and are committed to graduate education through the master's degree. They award 40 or more master's degrees annually in three or more disciplines.[3]

**Master's (Comprehensive) Universities and Colleges II**: These institutions offer a full range of baccalaureate programs and are committed to graduate education through the master's degree. They award 20 or more master's degrees annually in one or more disciplines.[3]

**Baccalaureate (Liberal Arts) Colleges I**: These institutions are primarily undergraduate colleges with major emphasis on baccalaureate degree programs. They award 40 percent or more of their baccalaureate degrees in liberal arts fields[4] and are restrictive in admissions.

**Baccalaureate Colleges II**: These institutions are primarily undergraduate colleges with major emphasis on baccalaureate degree programs. They award less than 40 percent of their baccalaureate degrees in liberal arts fields[4] or are less restrictive in admissions.

**Associate of Arts Colleges**: These institutions offer associate of arts certificate or degree programs and, with few exceptions, offer no baccalaureate degrees.[5]

**Specialized Institutions**: These institutions offer degrees ranging from the bachelor's to the doctorate. At least 50 percent of the degrees awarded by these institutions are in a single discipline. Specialized institutions include:

**Theological seminaries, Bible colleges and other institutions offering degrees in religion**: This category includes institutions at which the primary purpose is to offer religious instruction or train members of the clergy.

**Medical schools and medical centers**: These institutions award most of their professional degrees in medicine. In some instances, their programs include other health professional schools, such as dentistry, pharmacy, or nursing.

**Other separate health profession schools**: Institutions in this category award most of their degrees in such fields as chiropractic, nursing, pharmacy, or podiatry.

**Schools of engineering and technology**: The institutions in this category award at least a bachelor's degree in programs limited almost exclusively to technical fields of study.

**Schools of business and management**: The schools in this category award most of their bachelor's or graduate degrees in business or business-related programs.

**Schools of art, music, and design**: Institutions in this category award most of their bachelor's or graduate degrees in art, music, design, architecture, or some combination of such fields.

**Schools of law**: The schools included in this category award most of their degrees in law. The list includes only institutions that are listed as separate campuses in the 1994 Higher Education Directory.

**Teachers colleges**: Institutions in this category award most of their bachelor's or graduate degrees in education or education-related fields.

**Other specialized institutions**: Institutions in this category include graduate centers, maritime academies, military institutes, and institutions that do not fit any other classification category.

**Tribal colleges and universities**: These colleges are, with few exceptions, tribally controlled and located on reservations. They are all members of the American Indian Higher Education Consortium.

Notes on Definitions

1. Doctoral degrees include Doctor of Education, Doctor of Juridical Science, Doctor of Public Health, and the Ph.D. in any field.
2. Total federal obligation figures are available from the National Science Foundation's annual report called Federal Support to Universities, Colleges, and Nonprofit Institutions. The years used in averaging total federal obligations are 1989, 1990, and 1991.
3. Distinct disciplines are determined by the U.S. Department of Education's Classification of Instructional Programs 4-digit series.
4. The liberal arts disciplines include English language and literature, foreign languages, letters, liberal and general studies, life sciences, mathematics, philosophy and religion, physical sciences, psychology, social sciences, the visual and performing arts, area and ethnic studies, and multi- and interdisciplinary studies. The occupational and technical disciplines include agriculture, allied health, architecture, business and management, communications, conservation and natural resources, education, engineering, health sciences, home economics, law and legal studies, library and archival

sciences, marketing and distribution, military sciences, protective services, public administration and services, and theology.

5. This group includes community, junior, and technical colleges.

The Carnegie Classification of Higher Education is pictorially depicted below. Under each category title are the rules of category membership. As illustrated, this categorization system does not seem to have any one organizing principle. Each category is individually organized, with no consistency from category to category. However, one obvious aspect of consistency in four of the six categories is the distinction of two subcategories in the category -- one central and one corollary. For example, in the category of Research Universities, there are two subcategories – Research Universities I and Research Universities II. Research Universities I is the central subcategory, with the greater amount of Federal support and greater number of disciplinary degrees offered. A similar structure of one central and one corollary subcategory is found in the Doctoral, Master's, and Baccalaureate categories.

The chaining principles, or the rules for category membership, have been established based on varying institutional characteristics. These characteristics have been chosen as the important distinguishing characteristics for each individual type. All in all, the system is complex, yet not complex enough to capture the complexities of the higher education system as a whole. This is illustrated by the two categories which are catch-alls -- Specialized Institutions and Other Specialized Institution, functioning to include unique

institutions that do not fit elsewhere in the categorization. A more detailed categorization system would be made up of more specifically defined categories.

Figure 3. Graphic Representation and Categorization Rules of the Carnegie Classification of Higher Education Institutions

| **Research Universities** | **Doctoral Universities** | **Master's (Comprehensive) Universities & Colleges** | **Baccalaureate Colleges** |
|---|---|---|---|
| -Federal Support<br>-Number of disciplines | -Number of degrees<br>-Number of disciplines | -Number of degrees | -Percentage of degrees in liberal arts<br>-Admissions restrictiveness |

| **Associate of Arts Colleges** | **Specialized Institutions** | **Other Specialized Institutions** | **Tribal Colleges &Universities** |
|---|---|---|---|
| -Associate of Arts degrees | -50% of degrees in single discipline | -Institutions that do not fit in any other category | -Tribally controlled & located on reservations (with few exceptions) |

The values woven into this categorization system are interesting and revealing of the values attributed to different institutional types. The values that this categorization system embody are not necessarily congruent with those embodied by the ICM described earlier. The ICM is an idyllic conception of the students' college experience. In contrast, this categorization system does not reference the students' experience beyond degrees awarded or disciplines offered. Rather, this system embodies an ICM of what could be called the economic contributions that institutions make to society. In this scheme, the 'economic contribution' is operationalized by the level of degree, number of degrees awarded, and range of disciplines. Basically, the system as it stands sets out a hierarchy of institutional value based on the graduation of students with advanced degrees along with the highest amount of federal support. In this value system, Research Universities I are given the highest status. These values get acted out by professional academics and higher education administrators, who view Research Universities I as the most respectable institutions to work for. Moreover, academics and administrators at institutions in other categories often emulate the programs and policies of their neighbors at Research Universities I.

Generally speaking, the organizing principle at work in this categorization system is as follows: the more higher degrees an institution grants in a wider range of disciplines and the more federal money it receives, the more value is given to the institution. Thus, under this organizing principle, community colleges -- which only award degrees as high as the Associate of Arts degree and which receive minuscule amounts of federal money -- fall low on the rungs of the ladder of institutions of higher education.

Curriculum as Classifier

In several existing categories in the Carnegie Classification, classifications are based on the number of disciplines in which students can get degrees. This characteristic captures one aspect of the curriculum -- the range of disciplinary degrees available at an institution. Another approach could be to instead focus on the actual courses offered by an institution. This approach is unique and has not been previously used in the classification of higher education institutions.

As the core of an educational institution, the courses that a college offers actualize the college's mission. For example, if a college is specializes in training students for direct employment, the curriculum would be heavily weighted with occupational and practical courses. Similarly, if the college emphasizes providing the groundwork for bachelor's degrees, the curriculum would be heavily weighted with courses in the traditional liberal arts.

The curriculum does not equivocate. The mix of courses actually being offered is an incontestable depiction of the purpose of a college. This is true for all types of higher education institutions. In terms of the community college in particular, the curriculum is an accurate representation of student course-taking behavior, because it is comprised only of courses in which students enroll (courses are routinely canceled when minimum enrollments are not met). I am proposing a classification system of Associate of Arts colleges based on an institution's curriculum. A classification based on the curriculum would create meaningful categories. These categories would fit with people's impressions of an institution because the classification would be based on the actual

courses offered by an institution. Students and staff at a particular institution know the extent of course offerings available; basing classification on course offerings will be in line with these experiences. To ascertain a method by which curriculum characteristics can be used to classify two-year colleges, historic and contemporary trends in the community college curriculum will be analyzed.

Previous Curriculum Studies

From its origins in the early 1900s, the community college curriculum has always held several distinct curricular missions. Over time, pre-baccalaureate education, vocational-technical education, remedial education, and continuing education have evolved into flourishing aspects of the curriculum. This historical review and analysis will draw upon past studies of community college course and program offerings to illustrate growth and change.

A common methodology for curriculum studies, and the one employed in the second part of this research project, is the analysis of college course catalogs. Studies as early as the 1900s employed this method of analyzing the community college curriculum. In his 1931 book, *The Junior College*, W. C. Eells reviewed and compared several such curriculum studies dating from 1918 to 1930. He refers to the earliest doctoral dissertation about community colleges, which was written in 1919. This study showed that in a sample of 19 public colleges, 82 percent of the course offerings were academic and 18 percent were vocational.

Eells looked in more detail at studies conducted in 1921, 1928, and 1930. Respectively, in 1921, 1928, and 1930, the researchers found 76 percent, 75 percent, and 73 percent of the course offerings were academic in nature. This steady – although slight - decline of academic course offerings points to a slowly-gaining prominence of the non-academic curriculum.

In looking at the academic disciplines that made up the greatest proportion of the curriculum from 1921 to 1930, the five top academic disciplines, remained the same, with natural sciences making up 20 to 24 percent of the academic curriculum, modern languages making up around 18 to 22 percent, social sciences making up 14 to 17 percent, mathematics making up steadily around 10 percent, and English making up 9 to 10 percent. The greatest percent change between 1921 and 1930 was the increase in music course offerings, increasing from 4.5 to 8.4 percent of the academic curriculum.

A closer look at non-academic offerings in the 1921, 1928, and 1930 studies shows that in all three studies, commercial courses -- which would presumably include trade and industrial training courses -- made up the greatest percentage of the non-academic curriculum, followed by engineering and home economics. The greatest percent change from 1921 to 1930 was seen in commercial course offerings, decreasing from 44 to 24 percent of the non-academic curriculum. On the other side of this shift, no dramatic increases in any one subject area were found. This trend can be understood as the non-academic curriculum beginning to diversify into different, more specialized training courses.

In summary, across academic and non-academic course offerings, the five subject areas that made up the greatest percentage of the curriculum in each of the three studies are reported in Table 2.

Table 2. Top Five Subject Areas in the Community College Curriculum in 1921, 1928, and 1930

| 1921 | 1928 | 1930 |
|---|---|---|
| Natural Sciences (17.5%) | Natural Sciences (15.4%) | Natural Sciences (17.2%) |
| Modern Languages (16.5) | Modern Languages (14.9) | Modern Languages (13.4) |
| Social Sciences (10.8) | Social Sciences (10.3) | Social Sciences (12.3) |
| Commercial Courses (10.5) | Commercial Courses (9.9) | Mathematics (7.5) |
| Mathematics (7.6) | Mathematics (8.1) | English (7.3) |

Source: Eells (1931)

The three above-described studies give a clear picture of the curriculum in public junior colleges in the 1920s and early 1930s. Following these studies, there are few comprehensive studies of the curriculum between the 1930s and 1950s. Putnam's 1951 survey of course offerings included an analysis of course catalogs from 425 public and private junior colleges. The author was specifically looking at "new-type general education courses," or courses that he evaluated as different than traditional courses. The following are some examples of courses that were newly introduced in the early 1950s.

In parentheses is the percentage of the institutions in Putnam's sample that were offering this course.

- Health (44%)
- Music Appreciation (34%)
- Social Problems, World Today (26%)
- History of the World (24%)
- Art Appreciation (23%)
- College Orientation (22%)
- Physical Sciences Survey (18%)
- Communication (12%)
- Introduction to Business (10%)
- First Aid (8%)
- Mental Hygiene (7%)
- Survey of Social Sciences (7%)
- Preparation for Marriage (6%)
- Humanities Survey (5%)
- Work Experience & Student Activities (4%)
- Choosing a Vocation (3%)
- Great Books (2%)

In the 1920s and 1930s, the curriculum was largely limited to traditional subjects, such as those reported in the studies conducted by Koos, Whitney, and Hollingsworth-Eells. Putnam's work illustrates that by 1951, junior colleges were beginning to incorporate new and varied courses in their curriculums.

Another area of the curriculum that was increasingly expanded during the 1950s was remedial education. Koos (1970) stated that the earliest remedial education efforts were seen in the 1930s. Koos also described how remedial reading education as an

institutional objective increased momentum through the 1940s into the 1950s and that by 1956, three-fourths of 418 institutions had reported remedial reading programs.

Along with the emergence of new-type general education courses and remedial courses, the other major change in the community college curriculum during the 1950s is the blossoming of occupational courses. Medsker (1960) studied the percentage of colleges that offered courses in different occupational fields in 1955-56. Selected occupational course offerings are reported below with the percentage of Medsker's sample.

- Business (67%)
- Agriculture (27%)
- Engineering aide (26%)
- Homemaking (26%)
- Auto, diesel mechanics (25%)
- Nursing (22%)
- Electronics (21%)
- Radio, TV (19%)
- Machine shop (18%)
- Secretarial (17%)
- Laboratory technician (17%)
- Commercial art (15%)
- Electrical shop (13%)
- Welding (12%)
- Photography (10%)
- Graphic arts (10%)
- Drafting, design (10%)
- Dental assisting (10%)
- Aviation (8%)
- Air conditioning, refrigeration (8%)
- Building trades (7%)
- Peace officer training (7%)
- Printing (7%)
- Merchandising (6%)
- Sheet metal (6%)
- Elementary education (6%)
- Cosmetology (6%)
- Recreational leadership (6%)
- Carpentry (6%)
- Mill and cabinet (5%)
- Clothing, tailoring (4%)
- Medical secretary (4%)
- Music (3%)
- Architecture (3%)
- Fine arts (3%)
- Woodwork (3%)
- Restaurant, hotel management (2%)
- Petroleum (2%)
- Nursery education (2%)
- Journalism (2%)

Thornton (1960; 1966; 1972) picked up where Medsker left off and presented the status of occupational curricula in 1958-59, 1962, and 1965-66 in three separate editions of his book, *The Community Junior College*. From these studies, business education emerges as dominant in the occupational curriculum of this time, with around half of all community colleges offering general and specialty business courses. Close to 20 percent of the institutions offered specialty courses in engineering technology. The percentage of colleges offering courses in the fields of data processing and nursing grew, whereas home economics courses showed a decrease. Police training was not coded in the first study and doubled in percentage between the second and third study. Both art and music had a much stronger presence in the curriculum at the time of the first survey; one possible explanation could be that these two fields became less known as occupational subjects and were instead offered as liberal arts courses.

Past Studies by the Center for the Study of Community College

Continuing in the tradition of earlier curriculum studies, the Center for the Study of Community Colleges (CSCC), under the direction of Arthur M. Cohen, has undertaken a periodic national survey of the community college curriculum. Beginning in 1975, the survey has involved the classification and counting of the number of course sections offered at a selection of community colleges and the calculation of estimated student enrollments in certain academic areas. In any given academic subject, a college may offer many sections to accommodate the number of students who want to enroll. By counting

course sections, a more accurate picture of the curriculum is compiled and a truer estimate of class size.

The following discussion will report findings from surveys conducted in 1975, 1977, 1983, 1986, and 1991, which were presented in Cohen and Brawer's (1996) book, The American Community College and in Cohen and Ignash (1994). Course offerings in the liberal arts -- including the humanities, social sciences, sciences, and mathematics -- are first reported.

## THE LIBERAL ARTS CURRICULUM

In the total liberal arts curriculum, CSCC studies have shown the stability of the major disciplines. Within the humanities, the disciplines that make up the greatest proportion of the curriculum have remained relatively the same. Table 3 reports the top five humanities disciplines across four CSCC studies.

Other than a shift from 1977 to 1983 in which foreign languages edged out history as the subject area that made up the greatest percentage of the humanities curriculum, the top five disciplines of the humanities curriculum remained the same. From 1977 to 1991, foreign languages have increased the most dramatically in class sections offered. Within the category of foreign languages, English as a Second Language courses account for this increase. As a percentage of humanities courses, other courses in specific foreign languages have remained at the same level. The other major disciplines show slight decreases in the percentage of the humanities curriculum that they made up. This trend can be understood as an ongoing diversification of the curriculum, with the major

disciplines remaining the most prevalent, but a greater variety of subject areas being offered.

Table 3. Top Five Subject Areas with the Most Class Sections in the Humanities (including their percentages of the total humanities curriculum)

| 1977 | 1983 | 1986 | 1991 |
|---|---|---|---|
| History (23.0%) | Foreign languages (27.7%) | Foreign languages (28.4%) | Foreign languages (35.8%) |
| Foreign languages (20.5%) | History (19.9) | History (21.5) | History (19.4) |
| Political science (16.6) | Political science (14.7) | Political science (13.5) | Political science (12.6) |
| Literature (11.4) | Literature (11.2) | Literature (10.0) | Literature (8.2) |
| Interdisciplinary humanities (7.2) | Interdisciplinary humanities (7.3) | Interdisciplinary humanities (5.7) | Interdisciplinary humanities (6.2) |

Source: Cohen & Brawer (1996)

In 1986 and 1991, the most class sections were offered in English, Mathematics, and Fine and performing arts, making up well over 50 percent of the total liberal arts curriculum. New categories and ways of classifying subject areas make it difficult to compare across time periods, however, these findings show commonalities with the 1920s and 1930s studies reported previously. Mathematics, Foreign languages, and English can be found in the top course offerings in both time periods (see Table 4).

Table 4. Top Five Subject Areas with the Most Class Sections in the Liberal Arts (including their percentages of the total liberal arts curriculum)

| 1986 (N=95) | 1991 (N=164) |
|---|---|
| English (21.0%) | English (22.5%) |
| Mathematics (20.0) | Mathematics (18.9) |
| Fine & performing arts (13.0) | Fine and performing arts (9.6) |
| Psychology (6.0) | Foreign languages (8.5) |
| Foreign languages (5.0) / Biology (5.0) | Psychology (5.4) |

Source: Cohen & Brawer (1996)

## THE NON-LIBERAL ARTS CURRICULUM

Based on CSCC studies, the non-liberal arts curriculum was found to make up 48 percent of the total curriculum in 1986 and 43 percent in 1991. Researchers attributed the reduction in the non-liberal arts curriculum to an increased proportion of students enrolling in traditional liberal arts classes (Cohen & Ignash, 1994). Table 5 presents in detail the breakdown of the non-liberal arts curriculum for 1991. Business and office courses made up one quarter of the non-liberal arts curriculum, followed by personal skills and avocational courses -- which was mainly composed of physical education and recreation courses, trade and industry, technical education, and health. These five disciplines together made up over 90 percent of the total non-liberal arts curriculum.

Table 5. Percentage of Course Sections by Subject Area in the Non-liberal Arts Curriculum, 1991

| Subject Area | Percentage of Non-Liberal Sections |
|---|---|
| Business and office | 24.6% |
| Personal skills and avocational courses | 19.1 |
| Trade and industry | 18.6 |
| Technical education | 18.1 |
| Health | 10.2 |
| Marketing and distribution | 3.4 |
| Education | 2.5 |
| Engineering technologies | 2.0 |
| Agriculture | 1.2 |
| Home economics | 0.2 |
| Other | 0.2 |
| Total | 100.0% |

Source: Cohen & Ignash (1994)

## THE TOTAL CURRICULUM

Table 6 brings together the liberal arts and non-liberal arts curriculum to give the whole picture of the 1991 total curriculum. The top three disciplines, humanities, English, and math and computer sciences, were in the liberal arts, followed by two non-liberal arts disciplines, business and office and personal skills and avocational courses. These five disciplines made up greater than 50 percent of the total curriculum.

Table 6. Percentage of Total Curriculum Across the Liberal Arts and Non-Liberal Arts, 1991

| Discipline | Percentage of Total Curriculum |
|---|---|
| Humanities | 13.42% |
| English | 12.75 |
| Math and computer sciences | 10.69 |
| Business and office | 10.67 |
| Personal skills and avocational courses | 8.27 |
| Trade and industry | 8.05 |
| Technical education | 7.87 |
| Sciences | 7.68 |
| Social sciences | 6.66 |
| Fine and performing arts | 5.42 |
| Health | 4.44 |
| Marketing and distribution | 1.46 |
| Education | 1.10 |
| Engineering technologies | 0.85 |
| Agriculture (non-liberal arts) | 0.51 |
| Home economics | 0.10 |
| Other | 0.07 |
| Total | 100.00% |

Source: Cohen & Ignash, 1994

Summary of Previous Studies

Studies as far back as the 1920s have reviewed community college course offerings. By comparing survey results, overall shifts in curricular emphasis emerge. In the early days of community colleges, over three quarters of the curricular offerings were academic, or what has been deemed in more contemporary studies as liberal arts. This fraction was steadily reduced during the mid 1900s to around half of curricular offerings, yet remained stable at this level through the 1970s to the early 1990s.

Natural sciences, modern languages and social sciences made up the greatest proportion of the curriculum in the 1920s and 1930s (Eells, 1931). During the mid-1900s, nontraditional liberal arts courses, remedial courses, and a broader range of non-liberal arts courses were introduced (Thornton, 1960, 1966, 1972). While "new-type" courses had infused each college's course schedule by the 1990s, traditional liberal arts disciplines -- the humanities, English, and math and computer science -- still topped the list of course sections offered.

## Chapter 5: Research Questions and Methodology

This study is driven by the following research questions:

1) What is the status of the contemporary community college curriculum and how does it compare to the curriculum of earlier years?
2) How can colleges be classified based on curriculum characteristics?

To answer the first question, I will analyze the data that I collected for the 1998 Center for the Study of Community Colleges' Curriculum Project. To address the second research question, I will first evaluate different dimensions upon which to base my classification scheme. Secondly, I will decide on the best classification scheme by the use of descriptive and analytic analyses, in particular, multiple regression analysis. Finally, I will apply the scheme to the colleges in the 1998 sample, presenting the results and discussing the implications of these findings.

### Sampling Methodology

Spring college catalogs and schedules were requested from approximately 950 public community colleges. Over a two month period, catalogs and schedules were received. After this period, any mailings received were not included in the sample. The mailings in the sample were subsequently reviewed and those that were incomplete (i.e., only the catalog or the schedule was sent) or those that did not include the schedule for the spring 1998 term were eliminated. In total, there were 459 usable sets of college catalogs and schedules. In addition, the sets received were compared to those that were included in the 1991 survey. Sixty-four of the sample of 459 had been included in the

1991 sample; this group will be called the matched sample from now on. This matching exercise was conducted so that nuances and changes at individual institutions could also be studied.

A sample of 164 was to be included in the 1998 survey, which is the same sample size as was used in the prior survey. Along with the matched sample, another 100 cases were needed. Through the use of SPSS, a random sample of 100 was selected from the remaining cases and was evenly divided between three college size categories of small, medium and large. Previous studies had shown that college size is a major determinant of curriculum patterns. The larger the college, the more variety in courses; small colleges do not have sufficient students to offer specialized courses in most areas.

To delineate the three college size categories, the original sample of 459 colleges was listed by total enrollments in ascending order. Then, the sample was evenly divided into three subsamples. The division of those subsamples was as follows:

Table 7. Enrollment of Small, Medium, and Large College Categories

| Total Enrollment | Category of College Size |
|---|---|
| $\leq$ 2,748 | Small |
| 2,749 - 6,140 | Medium |
| 6,141 + | Large |

To make a total sample of 164, the number of cases in each category was set at 54 for the small category and 55 for both the medium and large categories. Before a random sample could be done, the distribution of the 64 matched cases had to be determined. After that,

the number of unmatched cases needed in each category was found and randomly selected for by SPSS.

Table 8. Original Sample Size, Matched Sample, and Total Unmatched Sample

| College Size | Total in Original Sample | Total Matched | Total Needed for Final Sample | Total Needed Unmatched |
|---|---|---|---|---|
| Small | 153 | 25 | 54 | 29 |
| Medium | 153 | 10 | 55 | 45 |
| Large | 153 | 29 | 55 | 26 |

The 164 college catalogs and schedules were reviewed and coded based on a previously-developed coding scheme which was tailored by the elimination of some coding areas and the addition of others. This coding scheme, which was originally developed in the 1970s by the Center for the Study of Community Colleges, was first used solely for the exploration of the liberal arts curriculum. The coding areas were based on the disciplinary divisions in common use by such groups as the National Endowment for the Humanities and the National Science Foundation. In later surveys, attention was given to the non-liberal arts curriculum, at which time, the coding categories were designed in collaboration with community college practitioners. Changes that were incorporated in the present survey included the removal of the category, home economics, because of its virtual non-existence in present-day community college offerings. In addition, more specific categories were developed in the area of computer technology. Additional categories of internship courses and military science courses were

also added (see Appendix C for the complete list of coding areas). Using this elaborated coding scheme, courses offered were tallied and categorized and ultimately entered into an SPSS computer database.

Consistency in coding across institutions was strived for. Each college's coding sheet was reviewed by another member of the coding team in order to minimize coding errors and maximize coding uniformity. The following rules and definitions were established based on those followed in previous studies and on decisions made about new areas of research interest:

A. Each section of for-credit courses was counted separately in the tally.

B. Laboratories and tutorials were not counted, except in the case of remedial courses.

C. For each course, a decision was made by the coder about the transferability of the course to a public, in-state, four-year institution. This decision was made based on the college's description in the schedule or catalog -- in many cases, the course was deemed transferable if it was part of a transfer-oriented Associate degree program.

D. Courses were coded as distance courses when they were taught via television, internet, video conferencing, or correspondence.

E. Courses that were based on videos checked out from the college resource center were considered to be more like tutorials, and therefore not counted.

In the second phase of the study, requests for course enrollment data were sent to each of the 164 institutions. 59 mailed back printouts, disks, or email attachments. Of those 59, 16 were small, 22 were medium, and 21 were large institutions. In order to

increase the response rate, another round of request letters was sent out to 37 colleges. In total, 81 colleges submitted course-by-course enrollment printouts. Cross-referenced with the coded college schedules, enrollment figures from every 5th course on the enrollment printout were coded, tallied, and summed across the college sample to arrive at an estimated enrollment within each coding category. In addition, class sizes were extrapolated.

The presentation of the study findings will draw a portrait of the community college total curriculum. The disciplinary make-up of the curriculum is explored, as well as the frequency of remedial courses and the transferability of courses. Special attention is given to newly-emerging curricular offerings such as social and ethnic studies courses and distance courses. Student enrollments and average class sizes by discipline are also presented. In addition, a comparison with previous years' data is drawn.

## Chapter 6: Findings of the Present Study

From the 1998 Curriculum Project, 54 percent of the community college curriculum was made up of the liberal arts. In 1986 and 1991, respectively 52 and 56 percent of the curriculum was found to be in the liberal arts (Cohen & Ignash, 1994). Thus, these statistics show the stability of the curriculum between the liberal arts and the non-liberal arts; slightly over half of the curriculum has remained in the liberal arts over this time span.

### Student Enrollment by Academic Discipline

Table 9 compares the overall percentage of student enrollment by academic discipline in the community college liberal arts curriculum. The greatest increase in percentage of enrollment is found in Computer science. In the 1991 study, student enrollment in Computer science accounted for 2.31%. This percentage jumped to 4.14% in the 1998 sample. This increase is understandable in light of the skyrocketing need for workers skilled in computer technology.

The greatest decrease in percentage of enrollment -- albeit small in magnitude -- is found in Engineering sciences. In the 1991 sample, student enrollment in Engineering accounted for 1.61% of the total curriculum, whereas in 1998, it only accounted for .48%. This decrease may be partly explained by differences in coding. In 1998, courses that served vocational purposes were strictly coded in the non-liberal arts category, Engineering Technology. Nonetheless, these findings suggest that the Engineering

curriculum may be becoming more vocationally oriented, with less emphasis on preparing students who plan to transfer to Engineering programs at four-year institutions.

Considering the categories that account for the greatest percentage of the curriculum, English remained stable at about 20%, with only a slight decrease. Similarly, the category with the next largest enrollment, Introductory/Intermediate Mathematics, also remained stable at around 12 to 13% of the curriculum. The small increase in enrollment in this category further exhibits how the community college curriculum remains a strong provider of introductory mathematics skills.

Table 9. Percentages of Total Student Enrollment (Duplicate Head Count) And Average Class Size for All Liberal Arts Areas

| Discipline | 1991% | 1998% | 91 Class Size | 98 Class Size |
|---|---|---|---|---|
| *Humanities* | | | | |
| Art History/appreciation | 1.33 | 1.45 | 28 | 28 |
| Cultural anthropology | 0.49 | 0.49 | 30 | 26 |
| Foreign languages | 7.24 | 5.82 | 20 | 19 |
| History | 6.23 | 6.46 | 31 | 29 |
| Interdisciplinary humanities | 1.48 | 0.83 | 35 | 25 |
| Literature | 1.90 | 2.21 | 23 | 22 |
| Fine and performing arts | 0.47 | 0.54 | 28 | 29 |
| Music history/appreciation | 1.03 | 1.38 | 27 | 27 |
| Philosophy and logic | 2.25 | 2.07 | 29 | 26 |
| Political science | 3.91 | 3.26 | 29 | 26 |
| Religious studies | 0.22 | 0.34 | 35 | 23 |
| Social and ethnic studies | 0.21 | 0.21 | 26 | 18 |
| English | 20.70 | 20.26 | 21 | 19 |

Table 9. Continued

| | | | | |
|---|---|---|---|---|
| *Fine and Performing Arts* | | | | |
| Dance | 0.43 | 0.37 | 16 | 16 |
| Music | 1.51 | 1.66 | 11 | 12 |
| Theater | 0.31 | 0.57 | 14 | 15 |
| Visual arts | 2.38 | 2.31 | 11 | 12 |
| | | | | |
| *Social Sciences* | | | | |
| Physical anthropology | 0.44 | 0.25 | 23 | 21 |
| Economics | 2.73 | 2.75 | 27 | 26 |
| Physical geography | 0.31 | 0.40 | 32 | 24 |
| Interdisciplinary social sciences | 0.47 | 0.48 | 20 | 24 |
| Psychology | 7.15 | 7.30 | 30 | 27 |
| Sociology | 4.03 | 4.18 | 31 | 28 |
| | | | | |
| *Sciences* | | | | |
| Biology | 6.43 | 7.03 | 26 | 24 |
| Chemistry | 2.05 | 2.00 | 20 | 19 |
| Earth & space sciences | 1.34 | 1.35 | 32 | 27 |
| Engineering sciences | 1.61 | 0.48 | 15 | 13 |
| Geology | 0.38 | 0.46 | 24 | 22 |
| Interdisciplinary sciences | 0.68 | 0.33 | 27 | 17 |
| Physics | 1.26 | 0.84 | 19 | 16 |
| | | | | |
| *Math and Computer Science* | | | | |
| Intro/Intermed. mathematics | 12.04 | 12.79 | 24 | 23 |
| Advance mathematics | 1.38 | 1.27 | 20 | 17 |
| Applied/technological math | 0.65 | 0.62 | 18 | 16 |
| Math for other majors | 1.57 | 1.55 | 23 | 21 |
| Computer science | 2.31 | 4.14 | 23 | 20 |
| Statistics | 1.08 | 1.57 | 27 | 23 |
| | 100.00 | 100.00 | | |

Community colleges have the reputation of maintaining small class sizes (Cohen & Brawer, 1996). When students are surveyed about their choice to attend community college, small class sizes are commonly mentioned as a contributing factor (Weglarz, 1999; Grossmont Cuyamaca Community College District, 1994). The results of this study support the fact of small classes at community colleges.

This study found no marked increases in class size as compared to the findings of the 1991 study. In fact, small decreases in average class sizes were found in many academic categories. For example, in the major subject areas, English class sizes in 1998 were down by 2 from 21 students in 1991. Likewise, Introductory/Intermediate Mathematics, Biology, and Psychology class sizes were all less in 1998 as compared to 1991. It must be noted, however, that these slight decreases in class size may partially be accounted for by different methods in calculation used in 1991 and 1998. In 1991, average class size was calculated based on reports from institutional contacts. In 1998, average class size was compiled from institutional printouts that designated the numbers of students enrolled in each class. In some cases, the printouts denoted when courses were canceled, but in many cases, courses were still listed as open even if only one to three students were enrolled. These courses with low enrollment may very well account for the overall lower class sizes.

The Number of Course Sections Offered

When tallies of course sections were compared with results from the 1991 study, a ranking of academic disciplines based on the number of course sections offered showed great similarities. In Table 10, the rankings show that in both 1991 and 1998 the three major disciplines with the greatest number of course sections offered were the Humanities, English, and Math and Computer Science. In both 1991 and 1998, these three disciplines accounted for 36 percent of the curriculum. One major shift was in Technical Education, which shifted up in its ranking from seventh to fourth place. In

contrast, Business and Office shifted down from fourth to fifth place. All in all, other than some slight changes and shifts, the curriculum has remained dominated by the same disciplines.

Table 10. Percentage of Total Curriculum by Major Discipline Areas

| | 1991 # of Sections | 1991% of Total | 1998 # of Sections | 1998 % of Total | 1991 Ranking | 1998 Ranking |
|---|---|---|---|---|---|---|
| Humanities | 14,034 | 13.42 | 17,828 | 12.82 | 1 | 1 |
| English | 13,327 | 12.75 | 16,905 | 12.15 | 2 | 2 |
| Math & computer sciences | 11,176 | 10.69 | 15,694 | 11.28 | 3 | 3 |
| Technical Education | 8,229 | 7.87 | 11,886 | 8.55 | 7 | 4 |
| Business and office | 11,156 | 10.67 | 11,158 | 8.02 | 4 | 5 |
| Personal skills & avocational | 8,643 | 8.27 | 9,650 | 6.94 | 5 | 6 |
| Sciences | 8,031 | 7.68 | 9,536 | 6.86 | 8 | 7 |
| Trade & Industry | 8,420 | 8.05 | 9,423 | 6.78 | 6 | 8 |
| Social sciences | 6,966 | 6.66 | 9,056 | 6.51 | 9 | 9 |
| Health | 4,641 | 4.44 | 8,040 | 5.78 | 11 | 10 |
| Fine & performing arts | 5,671 | 5.42 | 7,447 | 5.35 | 10 | 11 |
| Internships/Practica | N/A | N/A | 4,356 | 3.13 | N/A | 12 |
| Education | 1,147 | 1.10 | 2,396 | 1.72 | 13 | 13 |
| Engineering Technologies | 889 | 0.85 | 1,753 | 1.26 | 14 | 14 |
| Criminal justice | N/A | N/A | 1,405 | 1.01 | N/A | 15 |
| Marketing | 1,523 | 1.46 | 1,317 | 0.95 | 12 | 16 |
| Agriculture (non-liberal arts) | 529 | 0.51 | 808 | 0.58 | 15 | 17 |
| Other | 77 | 0.07 | 294 | 0.21 | 17 | 18 |
| Military Science | N/A | N/A | 131 | 0.09 | N/A | 19 |
| Home Economics | 106 | 0.10 | N/A | N/A | 16 | N/A |
| Total | 104,565 | 100.0 | 139,083 | 100.0 | | |

In comparing the 164 colleges surveyed in 1991 to those surveyed in 1998, the two samples were comparable in total numbers of students enrolled. Yet, when the course offerings were counted, the 1998 sample offered approximately 30,000 more courses. From this comparison, a conclusion could be made that colleges seem to be offering more courses without an increase in student enrollment overall. However, this

conclusion must be viewed in light of several factors of the research design. The 1998 study counted distance and internship/field study courses while the 1991 did not, which may account for a fraction of the extra courses. In addition, the inclusion of classes that may have been canceled because of low enrollment might also explain a portion of the increase in classes.

Remedial Education

The percent of course sections in the total sample that were remedial, as defined by the institutions, was 6.7 percent. A more meaningful representation of remedial courses is found when the disciplines of English and Math are looked at specifically, since very few remedial sections appear in other disciplines. Table 11 compares findings of the percentage remedial courses in English and Math in 1998, 1991, and 1986.

Table 11. Percentage of English and Math Courses that were Remedial, 1986, 1991, and 1986

| | 1986 | 1991 | 1998 |
|---|---|---|---|
| English | 37% | 31% | 29% |
| Math | 32% | 16%* | 32% |

*Cohen and Ignash (1994) explain the dip in percentage due to the fact that more remedial courses were beginning to be offered via laboratory format and lab classes were not counted in the 1991 study.

From 1986 to 1998, approximately one-third of English and Mathematics courses offered have been remedial. In terms of trends, the data show that remedial English

course offerings are steady at around 30 percent with a slight decrease, but no conclusive trends in remedial Mathematics can be made due to coding differences across studies.

Social & Ethnic Studies

Twenty-six percent of the colleges offered courses in ethnic studies. Compared to a level of 15 percent in 1975 and 9 percent in 1991, this subject area has grown dramatically (see Table 12).

Table 12. Percentage of Colleges Offering Social/Ethnic Studies Compared Across Surveys

| Category | 1975 (n=156) | 1977 (n=178) | 1983 (n=173) | 1986 (n=95) | 1991 (n=162) | 1998 (n=164) |
|---|---|---|---|---|---|---|
| Ethnic Studies | 15% | 15% | 6% | n/a | 9% | 26% |
| Women's Studies | 3 | 3 | 4 | n/a | 3 | 17 |
| Other Social Studies | 12 | 11 | 4 | n/a | 4 | 11 |

Courses in women's studies were offered by 17 percent of the sample institutions, whereas in 1975 only three percent offered such courses. The presence of multicultural courses also varied by college size in that large institutions are more likely to offer these courses (see Table 13).

Table 13. Number and Percentages of Colleges Offering Social/Ethnic Studies in Spring 1998

| Small (n=52) # / % of small colleges | Medium (n=54) # / % of med. colleges | Large (n=58) # / % of large colleges | Total (n=164) # / % of all colleges |
|---|---|---|---|
| 16 / 31% | 19 / 35% | 31 / 53% | 66 / 40% |

Overall, while enrollment in multicultural education courses make only a small percent of the enrollment in the community college curriculum, the most recent study results show an increase in the percentage of institutions that offer such courses.

Distance Education

Out of the total sample of 164 colleges, the frequency of distance for-credit courses -- defined as courses taught by television, Internet, two-way video, or correspondence -- was tabulated, excluding those distance courses not offered by that specific college. For example, those distance courses offered through a university or regional consortium were excluded.

Overall, 128 colleges out of the 164 offered distance courses, accounting for 78 percent of the sample. The number of distance courses offered at each institution ranged from one to 67. The mean number of courses was 14 and the median was 9. All together, distance courses accounted for 1.7 percent of the total for-credit curriculum for the sample. Table 14 shows the percentage of colleges offering distance education courses. Colleges not offering distance courses accounted for one-fifth of the sample, those

offering 10 or fewer distance courses accounted for one-third of the sample, and colleges offering eleven or more distance courses accounted for close to half of the sample.

Table 14. Percentage of Colleges that Offer Distance Education (N=164)

| Number of Distance Courses Offered | Number of Colleges | Percentage of Colleges |
|---|---|---|
| 0 | 36 | 22.0 |
| 1 – 3 | 16 | 9.7 |
| 4 – 10 | 40 | 24.2 |
| 11-19 | 26 | 15.6 |
| 20-29 | 20 | 12.0 |
| 30-39 | 11 | 6.6 |
| 40+ | 15 | 9.0 |

At the institutional level, only 10 percent of those that offered any distance courses offered less than four courses. Thus, even though the overall percentage of distance education in the community college curriculum may be low, in relation to the entire system of higher education, those community colleges that have incorporated distance technologies in their curricula are offering more courses in this format than other institutional types.

Course Transferability

Based on the review of catalog descriptions, the percentage of courses that were transferable to public, in-state four-year institutions was estimated. This task proved to be challenging because colleges take very different approaches to reporting this information in catalogs. While some colleges such as those in California clearly report

the transferability status to the University of California and to the California State University system for each course offered, other colleges do not present this information. For those colleges that did not directly report the transfer status of courses, courses were deduced to be transferable if there were included in a transfer-oriented Associate Degree program. Overall, 74 percent of liberal arts courses were found to be transferable and 34 percent of non-liberal arts courses were found to be transferable.

Summary of Findings

In the last two decades, the overall trend in the community college curriculum appears to be an increase in both the range of subject areas offered and the number of course sections offered. Both the range of curricular offerings and the number of course sections offered is directly related to the size of the college, with a greater range of subject areas and more sections offered at large colleges.

In general, the non-liberal arts course offerings continue to grow. There are certain subject areas in which all institutions offer courses and there are other subject areas in which institutions provide specialized training in response to unique needs of the community and local economy. The most commonly found non-liberal arts courses are business and office skills, marketing and distribution, health sciences, computer applications, and education.

In the liberal arts, only limited growth has been found in emerging fields such as interdisciplinary offerings and social and ethnic studies. The liberal arts is a highly stable component of the community college curriculum. Nonetheless, slight changes in the

percentage of courses offered within different liberal arts disciplines are found. For example, the number of remedial English and psychology offerings have increased while the number of engineering courses and physical anthropology courses have decreased. Overall, the liberal arts curriculum at community colleges remains a centerpiece in the American system of higher education, providing general education to the majority of all students, both those destined to transfer and those who are pursuing vocational interests. And it has been remarkably stable since the mid-1970s.

## Chapter 7: A Proposed Classification System

In order to construct a meaningful and practical categorization system for community colleges, institutional characteristics and their relationships to each other must be thoroughly analyzed. Characteristics of the curriculum and their relationships with other institutional characteristics will be the focus of this proposed system. This analysis will precipitate patterns and trends in community colleges.

### An Intuitive Model

Intuitively, a division exists between those colleges that focus on liberal arts education that leads to transfer to baccalaureate-granting institutions versus those colleges that specialize in occupational training leading to direct employment. Considering the variation in the percentage of liberal arts in the total curriculum, community colleges overall do differ greatly in their emphasis on liberal arts versus occupational education. However, among the states there has been a historical division between community college systems that focus on the liberal arts and those that specialize in technical, or occupational, training. In fact, the colleges in some states (e.g. Indiana) maintain the word, "Technical" in their names. In others (e.g. Wisconsin), the colleges may be either two-year branches of the state university or vocational-technical institutes. And other states (e.g. Texas) maintain parallel systems of community and technical colleges. The rates of student transfer to baccalaureate-granting institutions vary accordingly (The Center for the Study of Community Colleges, 1997).

Following this intuitive distinction of liberal arts community colleges and occupational community colleges, this study will further explore other institutional variables that relate to this curricular characteristic. Aspects of enrollment, expenditures, and revenues will be considered. First, however, other curricular characteristics that were considered as possible dimensions for classifications will be reviewed.

## Other Curricular Dimensions Considered

The process of designing a classification system involves trial and error. Classification models are considered and evaluated from an intuitive perspective. If a model seems to be intuitively sound, then the variables involved are tested in terms of statistical significance. Several curricular dimensions were considered and tested as possible variables by which to classify community colleges. Specifically, three other curricular characteristics were considered -- the percentages of the curriculum that is made up of remedial courses, distance courses, and transferable courses

### Remedial Course Offerings

Public attention has been drawn to remedial education as a sign of the pervasive problem of underprepared students. New York's Mayor Guiliani sparked the most recent round of debates regarding remedial education offered by community colleges. He called for the complete elimination of these programs from New York's system (Levy, 1998). His plan involved the contracting of private, proprietary institutions to provide this service. Giuliani's contention was that remedial education should not be the

responsibility of the state's community colleges. Other states have also tried to eliminate or limit the remedial courses available (Ignash, 1997). Yet college and university officials increasingly call upon community colleges to fill in the gaps. In the face of that rising demand, one chancellor of a community college district expressed the fears of many community college administrators and faculty when he said, "We must not destroy the integrity of the ongoing occupational and academic programs serving so many of our community college students by just shifting existing resources to remedial work" (quoted in Ignash, 1997).

Analysis of the extent of remedial course offerings is crucial to assess whether the community college curriculum is swaying more toward remedial education, away from other purposes. Is the curriculum becoming monopolized by remedial course offerings? Results show that the mean and median numbers of remedial courses offered is 57 and 37 respectively and the average percent of courses that are remedial is less than 7 percent, with a standard deviation of 5. Thus, because of this low percentage, community colleges cannot be considered primarily remedial institutions. In addition, the minimal standard deviation in percentages of remedial courses shows that colleges cannot be clearly classified based on the extent of their remedial education programs.

Distance Courses

Distance education is currently a hot topic, but is nothing new. Dating back to the to the 18th century, methods of teaching students at a distance have been continuously employed (Holmberg, 1986; Verduin & Clark, 1991). Distance education has utilized

such tools as written correspondence, film, radio, television, video, and the newest tool, computers. With the advent of computer technology and the Internet, the education community is once again abuzz with discussion and debate about the benefits and drawbacks of this mode of course delivery. The benefits of distance education are clear -- it makes the classroom more convenient than ever. But in terms of the curriculum, it is not so clear whether students receive a comparable learning experience.

Because of the controversy surrounding distance education and because of the blossoming of academic programs -- even entire institutions -- that are primarily or solely based on the Internet, the extent of courses offered via distance technologies may be a significant characteristic of community colleges. However, at this early stage in the development and use of distance education, the overall percentage of courses offered via distance is miniscule. Because most colleges only offer a small number of distance courses, ranging from one to 67, with a mean and median number of courses of 14 and 9 respectively, this characteristic is not a sound choice by which to classify community colleges.

Transfer Courses

A common and practical-sounding recommendation is that community colleges should be classified based on their curricular focus on transfer versus job training. One way to measure the degree to which a college is transfer-oriented is to analyze the course offerings that transfer to four-year institutions. While this approach may seem valid, operationalizing it is difficult and highly interpretive.

It is not widespread practice to designate in the college catalog or schedule whether or not a course transfers to a four-year institution. This is due to the fact that colleges often have to establish separate articulation agreements with different four-year institutions. As such, courses may transfer to one four-year institution and not another or may be added to or removed from the list of acceptable courses repeatedly. Nonetheless, some community colleges, such as those in California and Texas, do designate whether courses are transferable to public, in-state universities. Other community colleges stipulate that courses that are part of Associate Degree programs are transferable to public, in-state institutions. At bottom also is the realization however that practically any course may well be accepted for baccalaureate credit at some university.

Based on this study's interpretation, colleges offer an average of 53 percent transfer courses, with a range from 10 to 86 percent. Despite the sizeable range, which would point to the conclusion that this characteristic is a useful one in classifying colleges, this characteristic is highly interpretive and difficult to quantify in any reliable manner. Consequently, this characteristic was not pursued further as a dimension for classification.

The Liberal Arts as the Basis for Classification

The percentage of liberal arts courses that a community college offers is a useful representation of the focus of the institution. From this one variable, one can interpret whether a college emphasizes the liberal arts or occupational training, or if the college curriculum is equally balanced.

The Stability of the Liberal Arts Curriculum Over Time

In order to establish that the percentage of liberal arts is a stable characteristic over time, data from 57 colleges that were part of both the 1991 and 1998 samples were compared. The total number of liberal arts courses offered at these institutions in 1991 and 1998 was extremely highly correlated at the 0.01 level at 0.851. The percentages of liberal arts courses at the 57 institutions in 1991 and 1998 were also correlated at the 0.01 level at 0.680. These correlations confirm that the liberal arts curriculum is a relatively stable characteristic appropriate on which to base a classification system.

Relating Curricular Characteristics to Other Institutional Characteristics

A useful classification system is based on readily available information or data. If the characteristics on which a classification system is based are too difficult to come by, then the process of classification no longer is feasible. The CSCC Curriculum Project compiled curricular data through a time-consuming process of collecting, analyzing and coding college course schedules. This method is not practical, unless it were to be adopted by the National Center of Education Statistics in their standard data collection practices, which is not likely. Instead, the most practical and feasible approach would be to use existing data sets as the source of institutional data on which to base a classification scheme. By considering the relationships between curricular characteristics and other characteristics that are routinely measured by the National Center for Education Statistics, a viable and meaningful classification model can be designed with readily available data acting as proxies for curricular characteristics.

Below are the means, medians, and range of values for selected variables, including the variable that is under consideration as a basis for classification, "Percent of Liberal Arts." Of the original 164 institutions in the study sample, 151 were included in this analysis. Eight institutions were eliminated from the sample because expenditure and revenue data were unavailable through the Integrated Postsecondary Education Data System (IPEDS). In addition, five institutions that had incomplete revenue data -- specifically, the state appropriations were not reported -- were also eliminated.

Table 15. Descriptive Statistics of Selected Variables (N=151)

| Variable | Mean | Median | Range |
|---|---|---|---|
| **Curriculum Project Variables** | | | |
| Percent Liberal Arts | 53.2 | 53.3 | 23.3 - 78.0 |
| Percent Transfer | 52.6 | 51.8 | 10.5 - 86.1 |
| Percent Remedial | 6.8 | 5.5 | 0 - 28.5 |
| Percent English | 12.2 | 12.0 | 4.0 - 29.1 |
| Percent Business | 8.5 | 7.8 | 2.8 - 28.2 |
| **IPEDS Variables** | | | |
| Total Enrollment | 5,792 | 3,887 | 721 - 24,678 |
| Total Revenues | 260,000,000 | 190,000,000 | 4,903,566 - 99,296,005 |
| Percent State Appropriations | 36.9 | 34.2 | 7.7 - 71.9 |
| Percent Federal Appropriations | 0.5 | 0.0 | 0.0 - 12.3 |
| Percent Local Appropriations | 17.6 | 15.8 | 0.0 - 62.3 |
| Percent Auxiliary Revenues | 5.2 | 5.6 | 0.0 - 15.1 |
| Total Expenditures | 240,000,000 | 180,000,000 | 4,042,279 - 95,775,566 |
| Expenditures Per Student | 4,637 | | 1,811 – 10,569 |
| Percent Instruction Expenditures* | 43.1 | 42.2 | 19.8 - 65.9 |
| Percent Faculty Salary Expenditures | 30.3 | 30.0 | 17.1 - 44.8 |
| Percent Scholarship Expenditures | 12.0 | 10.8 | 2.4 - 32.6 |

*Includes Faculty Salary Expenditures

## VARIABLE DEFINITIONS

*Percent Liberal Arts* – Percent of total courses offered that is in the liberal arts

*Percent Transfer* -- Percent of total courses offered that is transferable to in-state, four-year institutions

*Percent Remedial* -- Percent of total courses offered that is deemed "remedial" or "developmental" by the institution

*Percent English* -- Percent of courses offered that is in the academic discipline of English

*Percent Business* -- Percent of courses offered that is in the academic discipline of Business and Office

*Total Enrollment* -- Total number of students enrolled in the institution in 1996

*Total Revenues* -- Total revenues of the institution in 1996-97

*Percent State Appropriations* -- Percent of total revenues that came from the state

*Percent Federal Appropriations* -- Percent of total revenues that came from the federal government

*Percent Local Appropriations* -- Percent of total revenues that came from local sources

*Percent Auxiliary Revenues* -- Percent of total revenues that came from auxiliary services of the institution

*Total Expenditures* -- Total expenditures of the institution in 1996-97

*Expenditures Per Student* -- Total expenditures in 1996-97 divided by total students enrolled in 1996

*Percent Instruction Expenditures* -- Percent of total expenditures that went toward instruction (includes classroom expenses and staff and faculty salaries)

*Percent Faculty Salary Expenditures* -- Percent of total expenditures that went toward faculty salary expenditures

*Percent Scholarship Expenditures* -- Percent of total expenditures that went toward scholarships

Correlations among institutional characteristics reveal significant relationships between variables (see Table 16). Of special interest to this project are those variables that are correlated with the variable, "Percent Liberal Arts." Other curricular characteristics that are significantly positively correlated with this variable are "Percent Transfer," "Percent Remedial," and "Percent English." Whereas "Percent Business" is significantly negatively correlated.

Table 16. Correlations across Curricular Characteristics and Other Institutional Characteristics (N=151)

| Variable | **Percent Liberal Arts** | Percent Transfer | Percent Remedial | Percent English | Percent Business | Total Enrollment |
|---|---|---|---|---|---|---|
| Percent Liberal Arts | **1.00** | | | | | |
| Percent Transfer | **0.60**** | 1.00 | | | | |
| Percent Remedial | **0.33**** | -0.03 | 1.00 | | | |
| Percent English | **0.60**** | 0.14 | 0.65** | 1.00 | | |
| Percent Business | **-0.46**** | -0.57** | -0.11 | -0.21** | 1.00 | |
| Total Enrollment | **0.32**** | 0.36** | 0.06 | 0.16 | -0.29** | 1.00 |
| Total Revenues | **0.26**** | 0.25** | 0.05 | 0.12 | -0.23** | 0.88** |
| Percent State Appropriations | **-0.09** | -0.25** | 0.20* | 0.01 | 0.16 | -0.17* |
| Percent Federal Appropriations | **-0.10** | -0.61 | -0.01 | 0.00 | 0.10 | -0.13 |
| Percent Local Appropriations | **-0.01** | 0.20 | -0.14 | -0.08 | -0.22** | 0.22** |
| Percent Auxiliary Revenues | **-0.21**** | 0.03 | -0.28** | -0.13 | -0.10 | -0.09 |
| Total Expenditures | **0.26**** | 0.24** | 0.07 | 0.13 | -0.22** | 0.88** |
| Expenditures Per Student | **-0.30**** | -0.26** | -0.86 | -0.19* | 0.07 | -0.38** |
| Percent Instruction Expenditures | **-0.32**** | -0.28** | -0.10 | -0.19* | 0.30** | 0.02 |
| Percent Faculty Salary Expenditures | **-0.19*** | -0.21** | -0.05 | -0.08 | 0.22** | 0.15 |
| Percent Scholarship Expenditures | **0.19*** | 0.06 | 0.13 | 0.13 | -0.10 | -0.16 |

**significant at the 0.01 level; *significant at the 0.05 level

Table 16. Continued

| Variable | Total Revenues | Percent State Appropriations | Percent Federal Appropriations | Percent Local Appropriations | Percent Auxiliary Revenues |
|---|---|---|---|---|---|
| Percent Liberal Arts | | | | | |
| Percent Transfer | | | | | |
| Percent Remedial | | | | | |
| Percent English | | | | | |
| Percent Business | | | | | |
| Total Enrollment | | | | | |
| Total Revenues | 1.00 | | | | |
| Percent State Appropriations | -0.30** | 1.00 | | | |
| Percent Federal Appropriations | -0.10 | 0.05 | 1.00 | | |
| Percent Local Appropriations | 0.27** | -0.69** | -0.07 | 1.00 | |
| Percent Auxiliary Revenues | -0.07 | -0.14 | 0.13 | -0.03 | 1.00 |
| Total Expenditures | 0.99** | -0.28** | -0.10 | 0.26** | -0.12 |
| Expenditures Per Student | 0.05 | -0.16* | 0.14 | -0.03 | -0.07 |
| Percent Instruction Expenditures | 0.02 | 0.22** | 0.11 | -0.04 | 0.07 |
| Percent Faculty Salary Expenditures | 0.11 | 0.22** | 0.01 | 0.03 | 0.04 |
| Percent Scholarship Expenditures | -0.10 | -0.12 | -0.04 | 0.22** | -0.06 |

**significant at the 0.01 level; *significant at the 0.05 level

Table 16. Continued

| Variable | Total Expenditures | Expenditures Per Student | Percent Instruction Expenditures | Percent Faculty Salary Expenditures | Percent Scholarship Expenditures |
|---|---|---|---|---|---|
| Percent Liberal Arts | | | | | |
| Percent Transfer | | | | | |
| Percent Remedial | | | | | |
| Percent English | | | | | |
| Percent Business | | | | | |
| Total Enrollment | | | | | |
| Total Revenues | | | | | |
| Percent State Appropriations | | | | | |
| Percent Federal Appropriations | | | | | |
| Percent Local Appropriations | | | | | |
| Percent Auxiliary Revenues | | | | | |
| Total Expenditures | 1.00 | | | | |
| Expenditures Per Student | -0.04 | 1.00 | | | |
| Percent Instruction Expenditures | 0.00 | 0.03 | 1.00 | | |
| Percent Faculty Salary Expenditures | 0.09 | -0.16 | 0.86** | 1.00 | |
| Percent Scholarship Expenditures | -0.09 | 0.17* | -0.41** | -0.36** | 1.00 |

**significant at the 0.01 level; *significant at the 0.05 level

Looking at other institutional characteristics, "Total Enrollment" is significantly positively correlated with "Percent Liberal Arts." In other words, institutions with higher numbers of students enrolled offer a greater percent of liberal arts courses. In some ways, this result may seem counterintuitive. It is a common misperception that colleges found in metropolitan or urban areas – which would typically be the institutions with large student enrollments – have a more vocationally-oriented curriculum. The positive correlation between total enrollment and percent liberal arts refutes this conclusion.

Furthermore, as a college grows in enrollment, its pre-existing occupational programs do not grow commensurately. A college with 5,000 enrollment may have a nursing program that admits 60 students per year. If enrollment doubles to 10,000 students, the nursing program may well continue admitting 60 students. The same holds true for other occupational programs. Their rise or decline is driven by factors unrelated to overall college enrollment.

With respect to details of expenditures and revenues, "Percent Liberal Arts" is positively correlated with "Total Revenues" and "Total Expenditures." Thus, colleges with larger revenues and expenditures have greater percentages of liberal arts offerings. This makes sense in light of the previously discussed correlation – that of total enrollment and percent liberal arts. Naturally, larger colleges have larger revenues and expenditures (as exemplified in a positive correlation of 0.88). This positive correlation reinforces the relationship between larger enrollments and larger percentages of liberal arts in the curriculum.

While "Percent Liberal Arts" is positively correlated with "Total Revenues" and "Total Expenditures," it is negatively correlated with "Expenditures Per Student." This means that those colleges that spend less per student have a greater percentage of liberal arts offerings and those that spend more per student have a greater percentage of occupational course offerings.

A negative correlation is also found between "Percent Liberal Arts" and both "Percent Instruction Expenditures" and "Percent Auxiliary Revenues." "Percent Instruction Expenditures" represents the percentage of total expenditures that goes toward

instructional costs such as faculty salaries and classroom supplies and equipment. This negative correlation is understandable in that there is less expense associated with classroom supplies and equipment in the teaching of the liberal arts versus the teaching of occupationally-oriented courses. Yet, the negative correlation is also a result of the negative correlation between "Percent Liberal Arts" and "Faculty Salary Expenditures." The negative correlation is slight (-0.19) and is only significant at the 0.05 level, but still, the implication of this finding is that at colleges with a greater percentage of liberal arts courses, less of the total expenditures go toward faculty salaries than at those institutions with a smaller percentage of liberal arts courses. A stronger significant correlation is found between colleges that have a high percentage of business courses and the percentage of their expenditures on instruction, including faculty salaries. Thus, instructional expenditures and faculty salaries seem to vary with the extent that the curriculum focuses on business and other technical courses.

The negative correlation between "Percent Liberal Arts" and "Percent Auxiliary Revenues" points to the fact that those colleges that have greater percentages of total revenues coming from auxiliary functions – such as continuing or contract education programs, community services, or child care programs – have lesser percentages of liberal arts in the curriculum. Perhaps colleges focusing on traditional liberal arts education devote less resources to auxiliary services. It may also be that auxiliary services are more associated with technical or occupational programs, such as those services such as workforce training modules and workshops that are marketed to local industry.

Regression Analysis

Multiple regression analysis helps to better understand the relationships of curricular and institutional characteristics. In this case, variables can be entered into a regression equation to see if they significantly contribute to the prediction of an institution's emphasis on liberal arts. Two stepwise, multiple regressions were run, with "Percent Liberal Arts" as the dependent variable in both. The first regression equation looks at curricular characteristics as predictors of the dependent variable. The second regression equation looks at financial characteristics as predictors of the dependent variable. In both cases, total enrollment is also included as an independent variable because of its significantly positive correlation with the dependent variable (see discussion in previous section). Variables that enter the equation have a significance level of 0.05 or less.

The first regression was run to see the predictive power of other aspects of the curriculum, specifically, those aspects that are clearly definable and could be easily counted. Whereas tracking the variable, "Percent Liberal Arts" would require counting all courses offered by an institution, to track variables such as "Total English Courses" or "Total Psychology Courses," only a small fraction of the total course offerings of an institution need be counted. However, some variables are less clearly defined, such as "Total Humanities Courses." Different definitions of "Humanities" exist and colleges may classify their course offerings differently in this respect. Even if a common definition of "Humanities" was applied, courses would have to be counted across numerous disciplines. Keeping in mind the importance of clarity in the definition of the

variable as well as the ease of quantifying the courses within the category, the following independent variables were selected:

Total Enrollment

Curricular Characteristics:

Total English

Total Psychology

Total Biology

Total Remedial

Total Distance

Table 17 lists the variables that entered the first regression equation to predict the percent liberal arts in the community college curriculum.

Table 17. Regression Predicting the Percent of Liberal Arts at Community Colleges. Variables are Shown in the Order that they Entered the Equation. (N=164)

| Independent Variable | Simple R | Multiple R | Beta |
|---|---|---|---|
| Total English | 0.36 | 0.13 | 0.36 |
| Total Distance | 0.41 | 0.41 | -0.23 |

The best predictor of the percent liberal arts is the total number of English courses offered. Overall, English courses made up 22.8 percent of the total liberal arts curriculum in the sample of 164 colleges. This fact explains why the total number of English courses

is the strongest predictor of the percentage of liberal arts courses in the curriculum – because English courses greatly contribute to that percentage.

The second variable to enter the regression equation is the number of distance courses. This variable is actually a negative predictor of percent liberal arts. This result can be understood in that many distance courses are offered in the non-liberal arts field of business and office.

For the second multiple regression, institutional characteristics associated with revenues and expenditures were included. The following institutional characteristics were selected as independent variables:

Total Enrollment

Expenditure Characteristics:

Expenditures Per Student

Percent Instruction Expenditures

Percent Scholarship Expenditures

Percent Faculty Salary Expenditures

Revenue Characteristics:

Percent State Appropriations

Percent Federal Appropriations

Percent Local Appropriations

Percent Auxiliary Revenue

Table 18 lists the variables that entered the regression equation to predict the percent liberal arts in the community college curriculum.

Table 18. Regression Predicting the Percent of Liberal Arts at Community Colleges. Variables are Shown in the Order that they Entered the Equation. (N=151)

| Independent Variable | Simple R | Multiple R | Beta |
|---|---|---|---|
| Total Enrollment | 0.34 | 0.12 | 0.34 |
| Percent Instruction Expenditure | 0.46 | 0.21 | -0.30 |
| Percent Auxiliary Revenue | 0.49 | 0.24 | -0.18 |
| Expenditures Per Student | 0.52 | 0.27 | -0.19 |

From the results of this regression, the most predictive institutional characteristic of the percent liberal arts in the curriculum is the total enrollment of the institution. The more students at an institution, the greater percent liberal arts in the curriculum. The other three variables that entered the regression equation entered as negative predictors. The percent of expenditures that go toward instructional costs is a negative predictor of the percent liberal arts, meaning that the greater the percent of expenditures that go toward instructional costs, the lesser the percent of liberal arts in the curriculum. In brief, colleges typically spend more per student in occupational programs. Similarly, the percent of revenues from auxiliary services is also a negative predictor of percent liberal

arts, meaning that the greater the percentage of revenues that comes from auxiliary services of the institution, the lesser the percentage of liberal arts in the curriculum. Finally, the amount that a college spends per enrolled student is a negative predictor of the percentage of the curriculum devoted to the liberal arts.

From these two regression analyses, it can be concluded that both curricular characteristics and other institutional characteristics can be used as predictors of the extent that the curriculum is focused on the liberal arts. In terms of curricular characteristics, the total number of English courses is the best predictor of the percentage of liberal arts in the curriculum. Moreover, the percentage of liberal arts in the curriculum is further negatively predicted by the total number of distance courses offered. The stability of this variable as a negative predictor, however, must be questioned. The use of distance technologies is rapidly increasing across the curriculum. In the future, the total number of distance courses could become even more of a negative predictor if these technologies become more prevalent in occupationally-oriented curricula. Or, it could even become a positive predictor if, with the spread of the use of technology, distance methods are adopted with increased frequency in the liberal arts. All in all, this predictive variable is a volatile one.

In terms of financial characteristics, the predictive power of the expenditure and revenue characteristics is not as strong as that of total enrollment of the institution. First and foremost, the total enrollment is a positive predictor of the percentage of liberal arts in the curriculum. After considering college size, a more refined prediction of the percentage of liberal arts in the curriculum can be made by considering the percentage of

expenditures going toward instruction, the percentage of revenue coming from auxiliary functions, and an institution's expenditures per student.

Proposed Categories

Based on the described analyses, the following categories are proposed to classify community colleges:

Figure 4. Proposed Categories to Classify Community Colleges

| Liberal Arts Community Colleges | Comprehensive Community Colleges | Occupational Community Colleges |
|---|---|---|
| Greater than 60% of the total curriculum is in the liberal arts | 40-60% of the total curriculum is in the liberal arts | Less than 40% of the total curriculum is in the liberal arts |

In order to make the classification system practical, proxies must be used to sort colleges into the above categories. Based on the above findings, two approaches are proposed -- one is based on curricular characteristics and one is based on institutional financial characteristics.

Total Enrollment as Proxy

Because of the statistically significant positive correlation between a college's total enrollment and the percentage of liberal arts courses that it offers, the characteristic of total enrollment may be a good proxy for categorizing colleges based on their

emphases on the liberal arts. While it is not as powerful predictor as the curricular characteristics of the numbers of English courses or distance courses offered, it did enter the regression equation before any revenue or expenditure variables.

Total enrollment of an institution does vary year to year. Any effort to classify colleges by size is limited by this variability. To establish the extent of the variability, several steps were taken. First, the 1991 and the 1998 size classifications of the matched sample of colleges -- the 64 colleges that were included in both the 1991 study and the current project -- were compared. Of this sample, 80 percent were classified within the same category. Second, because the size categories of the current project were established based on a sample of colleges, the same classification procedure was applied to the entire universe of community colleges. Ordering all colleges on ascending size, the colleges were divided evenly into three categories. While the value ranges for small, medium, and large colleges were different than those established from the sample, still 85 percent of the sample remained classified in the same category. These two tests have shown the relative stability of size categories based on total student enrollment across time and across samples.

The variable of total enrollment would be a convenient variable on which to base classification because it is readily available through the National Center for Education Statistics. However, it is most likely too simplistic to imagine that by the variable of total enrollment alone an accurate classification system could be designed. Instead, total enrollment may be most usefully used in conjunction with other characteristics that correlate with and predict the percentage of liberal arts in the curriculum.

Expenditures as Proxy

The percent expenditures on instructional costs can act as a negative proxy of the liberal arts emphasis of the curriculum. This approach would not require any extra data collection since the expenditure information is already collected by NCES. From these data, colleges can subsequently be sorted into the above three categories. Based on the total student enrollment, those colleges that have greater than average percentage expenditures on instruction for the size of the institution would be classified as Occupational. Those that have lesser than average percentage expenditures on instruction for the size of the institution would be classified as Liberal Arts. Those with about average percentage expenditures for instruction would be considered Comprehensive.

English Courses as a Proxy

The number of English courses associated with the total courses offered and total student enrollment would be one way to sort colleges into the above categories. Based on the total student enrollment, those colleges that have lower than average number of English courses for the size of the institution would be classified as Occupational. Those that have a greater than average number of English courses for the size of the institution would be classified as Liberal Arts. Those with about average number would be considered Comprehensive.

This approach would require some data collection through the counting of English course offerings and total number of course offerings. However, these data could be added to the information that institutions currently report to NCES.

## Testing the Proposed Classification Systems

Using the original sample of colleges and IPEDS financial data, the proposed classification system were tested. Below is the step-by-step procedure by which the community colleges in the study sample were classified using the proposed system as well as other configurations to find the best fitting scheme. The same procedure was undertaken many times, applying first the variable of total enrollment, then the criterion of the percentage of English courses offered and thirdly, the criterion of percent expenditures on instruction. The following section presents the results of each classification attempt. Each classification model is based on proxy variables that have been found to predict the percentage of liberal arts in the curriculum. The accuracy of each classification system is measured by how close the proxy model approaches the actual classification based on the percentage of liberal arts in the curriculum. In other words, the percentage of colleges that each proxy model accurately classifies is used as a measure of overall fitness of the model.

## The Actual Classification

Of the total sample of 164 colleges, 108 of them, or 66 percent, have a curriculum that is made up of a majority of the liberal arts (see Table 19). If the sample is divided instead into three categories, occupational, comprehensive, and liberal arts, as previously proposed, 41 institutions (25%) would be classified as liberal arts; 108 (66%) would be classified as comprehensive; and 14 (9%) would be classified as occupational (see Table 20).

Table 19. Actual Classification of Colleges into Two Categories based on Percentage of Courses in the Liberal Arts

| Liberal Arts Community Colleges | Occupational Community Colleges |
|---|---|
| Greater than or equal to 50% of the total curriculum is in the liberal arts | Less than 50% of the total curriculum is in the liberal arts |
| 66% | 14% |

Table 20. Actual Classification of Colleges into Three Categories based on Percentage of Courses in the Liberal Arts

| Liberal Arts Community Colleges | Comprehensive Community Colleges | Occupational Community Colleges |
|---|---|---|
| Greater than 60% of the total curriculum is in the liberal arts | 40-60% of the total curriculum is in the liberal arts | Less than 40% of the total curriculum is in the liberal arts |
| 25% | 66% | 9% |

Having established the actual classification of the colleges based on the percentage of liberal arts in the curriculum, the next section is an exploration and testing of the proxy models.

## Thirteen Classification Models Tested

Dimensional matrices were set up for each model to be tested, based on the criteria used in classifying. For each of the models described below, the same procedural steps were followed:

1. For those models which considered college size, colleges were divided into the established categories based on total student enrollment;
2. Within each size category or for the sample as a whole, the mean values of the criterion variables were calculated; and
3. A college was classified based on where its values of the criterion variables fell -- either below or above, or within a specified percentage, of the mean;
4. The accuracy of each model -- and more specifically, each cell in each model -- was determined by comparing each college's classification within that model back to the actual classification based on the percentage of courses actually offered in the liberal arts. The percentage of accurate classifications was subsequently computed.

The rest of this section will be a presentation of each model matrix and the degree of accuracy that it classified the sample colleges. Based on this information, the proposed classification system will either be accepted or rejected. If rejected, a revised proposal will be made, which presents the most accurate classification system possible derived from the tested variables.

Figure 5. Thirteen Classification Models Tested

1. Two Categories of Size by Two Categories of Curricular Content

| *Category Label:* | **Occupational** | **Liberal Arts** |
|---|---|---|
| *Category Criteria:* | Small Size (< 4000 total enrollment) | Large Size (≥ 4000 total enrollment) |
| *Percent Accurately Classified:* | 50% | 82% |

2. Three Categories of Size by Three Categories of Curricular Content

| *Category Label:* | **Occupational** | **Comprehensive** | **Liberal Arts** |
|---|---|---|---|
| *Category Criteria:* | Small Size (≤ 2,748) | Medium Size (2,749 – 6,140) | Large Size (≥6,141) |
| *Percent Accurately Classified:* | 43% | 69% | 93% |

3. Combined Small and Medium Categories and Large Category by Three Categories of Curricular Content

| *Category Label:* | **Occupational** | **Liberal Arts** |
|---|---|---|
| *Category Criteria:* | Small to Medium Size (≤6,140) | Large Size (≥6,141) |
| *Percent Accurately Classified:* | 52% | 93% |

4. Total Sample by Two Categories of the English Percentage Proxy

| *Category Label:* | **Occupational** | **Liberal Arts** |
|---|---|---|
| *Category Criteria:* | Percentage English Courses is Less than the Mean | Percentage English Courses is Equal to or Greater than the Mean |
| *Percent Accurately Classified:* | 56% | 89% |

5. Total Sample by Three Categories of the English Percentage Proxy

| *Category Label:* | **Occupational** | **Comprehensive** | **Liberal Arts** |
|---|---|---|---|
| *Category Criteria:* | Percentage English Courses is Less than 40% of the Mean | Percentage English Courses is from 40% to 60% of the Mean | Percentage English Courses is Greater than 60% of the Mean |
| *Percent Accurately Classified:* | 23% | 81% | 48% |

6. Two Categories of Size by Two Categories of the English Proxy

| *Category Label:* | **Small Occupational** | **Small Liberal Arts** |
|---|---|---|
| *Category Criteria:* | Percentage English Courses is Less than the Mean for Small Colleges | Percentage English Courses is Equal to or Greater than the Mean for Small Colleges |
| *Percent Accurately Classified:* | 74% | 75% |

| *Category Label:* | **Large Occupational** | **Large Liberal Arts** |
|---|---|---|
| *Category Criteria:* | Percentage English Courses is Less than the Mean for Large Colleges | Percentage English Courses is Equal to or Greater than the Mean for Large Colleges |
| *Percent Accurately Classified:* | 33% | 97% |

7. Three Categories of Size by Two Categories of the English Proxy

| | | |
|---|---|---|
| *Category Label:* | **Small Occupational** | **Small Liberal Arts** |
| *Category Criteria:* | Percentage English Courses is Less than the Mean for Small Colleges | Percentage English Courses is Equal to or Greater than the Mean for Small Colleges |
| *Percent Accurately Classified:* | 79% | 75% |

| | | |
|---|---|---|
| *Category Label:* | **Medium Occupational** | **Medium Liberal Arts** |
| *Category Criteria:* | Percentage English Courses is Less than the Mean for Medium Colleges | Percentage English Courses is Equal to or Greater than the Mean for Medium Colleges |
| *Percent Accurately Classified:* | 67% | 84% |

| | | |
|---|---|---|
| *Category Label:* | **Large Occupational** | **Large Liberal Arts** |
| *Category Criteria:* | Percentage English Courses is Less than the Mean for Large Colleges | Percentage English Courses is Equal to or Greater than the Mean for Large Colleges |
| *Percent Accurately Classified:* | 14% | 100% |

8. Three Categories of Size by Three Categories of the English Proxy

| *Category Label:* | **Small Occupational** | **Small Comprehensive** | **Small Liberal Arts** |
|---|---|---|---|
| *Category Criteria:* | Percentage English Courses is Less than 40% of the Mean for Small Colleges | Percentage English Courses is from 40% to 60% of the Mean for Small Colleges | Percentage English Courses is Greater than 60% of the Mean for Small Colleges |
| *Percent Accurately Classified:* | 43% | 82% | 33% |

| *Category Label:* | **Medium Occupational** | **Medium Comprehensive** | **Medium Liberal Arts** |
|---|---|---|---|
| *Category Criteria:* | Percentage English Courses is Less than 40% of the Mean for Medium Colleges | Percentage English Courses is from 40% to 60% of the Mean for Medium Colleges | Percentage English Courses is Greater than 60% of the Mean for Medium Colleges |
| *Percent Accurately Classified:* | 23% | 82% | 42% |

| *Category Label:* | **Large Occupational** | **Large Comprehensive** | **Large Liberal Arts** |
|---|---|---|---|
| *Category Criteria:* | Percentage English Courses is Less than 40% of the Mean for Large Colleges | Percentage English Courses is from 40% to 60% of the Mean for Large Colleges | Percentage English Courses is Greater than 60% of the Mean for Large Colleges |
| *Percent Accurately Classified:* | 0% | 79% | 64% |

9. Total Sample by Two Categories of the Instructional Expenditure Proxy

| *Category Label:* | **Occupational** | **Liberal Arts** |
|---|---|---|
| *Category Criteria:* | Percentage Instruction Expenditure is Greater than the Mean | Percentage Instruction Expenditure is Equal to or Less than the Mean |
| *Percent Accurately Classified:* | 33% | 61% |

10. Total Sample by Three Categories of the Instructional Expenditure Proxy

| *Category Label:* | **Occupational** | **Comprehensive** | **Liberal Arts** |
|---|---|---|---|
| *Category Criteria:* | Percentage Instruction Expenditure is Greater than 40% of the Mean | Percentage Instruction Expenditure is from 40% to 60% of the Mean | Percentage Instruction Expenditure is Less than 60% of the Mean |
| *Percent Accurately Classified:* | 6% | 61% | 7% |

11. Two Categories of Size by Two Categories of the Instructional Expenditure Proxy

| *Category Label:* | **Small Occupational** | **Small Liberal Arts** |
|---|---|---|
| *Category Criteria:* | Percentage Instruction Expenditure is Greater than the Mean for Small Colleges | Percentage Instruction Expenditure is Equal to or Less than the Mean for Small Colleges |
| *Percent Accurately Classified:* | 46% | 41% |

| *Category Label:* | **Large Occupational** | **Large Liberal Arts** |
|---|---|---|
| *Category Criteria:* | Percentage Instruction Expenditure is Greater than the Mean for Large Colleges | Percentage Instruction Expenditure is Equal to or Less than the Mean for Large Colleges |
| *Percent Accurately Classified:* | 20% | 83% |

12. Three Categories of Size by Two Categories of the Instructional Expenditure Proxy

| *Category Label:* | **Small Occupational** | **Small Liberal Arts** |
|---|---|---|
| *Category Criteria:* | Percentage Instruction Expenditure is Greater than the Mean for Small Colleges | Percentage Instruction Expenditure is Equal to or Less than the Mean for Small Colleges |
| *Percent Accurately Classified:* | 53% | 38% |

| *Category Label:* | **Medium Occupational** | **Medium Liberal Arts** |
|---|---|---|
| *Category Criteria:* | Percentage Instruction Expenditure is Greater than the Mean for Medium Colleges | Percentage Instruction Expenditure is Equal to or Less than the Mean for Medium Colleges |
| *Percent Accurately Classified:* | 41% | 58% |

| *Category Label:* | **Large Occupational** | **Large Liberal Arts** |
|---|---|---|
| *Category Criteria:* | Percentage Instruction Expenditure is Greater than the Mean for Large Colleges | Percentage Instruction Expenditure is Equal to or Less than the Mean for Large Colleges |
| *Percent Accurately Classified:* | 4% | 88% |

13. Three Categories of Size by Three Categories of the Instructional Expenditure Proxy

| *Category Label:* | **Small Occupational** | **Small Comprehensive** | **Small Liberal Arts** |
|---|---|---|---|
| *Category Criteria:* | Percentage Instruction Expenditure is Greater than 40% of the Mean for Small Colleges | Percentage Instruction Expenditure is from 40% to 60% of the Mean for Small Colleges | Percentage Instruction Expenditure is Less than 60% of the Mean for Small Colleges |
| *Percent Accurately Classified:* | 12% | 71% | 0% |

| *Category Label:* | **Medium Occupational** | **Medium Comprehensive** | **Medium Liberal Arts** |
|---|---|---|---|
| *Category Criteria:* | Percentage Instruction Expenditure is Greater than 40% of the Mean for Medium Colleges | Percentage Instruction Expenditure is from 40% to 60% of the Mean for Medium Colleges | Percentage Instruction Expenditure is Less than 60% of the Mean for Medium Colleges |
| *Percent Accurately Classified:* | 5% | 63% | 0% |

| *Category Label:* | **Large Occupational** | **Large Comprehensive** | **Large Liberal Arts** |
|---|---|---|---|
| *Category Criteria:* | Percentage Instruction Expenditure is Greater than 40% of the Mean for Large Colleges | Percentage Instruction Expenditure is from 40% to 60% of the Mean for Large Colleges | Percentage Instruction Expenditure is Less than 60% of the Mean for Large Colleges |
| *Percent Accurately Classified:* | 0% | 50% | 15% |

From the tests of these thirteen models, the originally proposed classification system is not deemed the best fitting system. The best fitting system would be #7, a system based on three categories of size and two categories of the English proxy. The categories would include the following: Small Occupational, Small Liberal Arts, Medium

Occupational, Medium Liberal Arts, Large Occupational, and Large Liberal Arts and are illustrated below:

Figure 6. Graphic Presentation of a Classification System Based on Percentage of English Courses in the Total Curriculum

| **Small Associate of Arts Colleges:** | **Medium Associate of Arts Colleges:** | **Large Associate of Arts Colleges** |
|---|---|---|
| -small, occupational | -medium, occupational | -large, occupational |
| -small, liberal arts | -medium, liberal arts | -large, liberal arts |

The practicality of this classification system may be limited at present because it would require that all community colleges report both the total number of English courses offered and the total number of courses overall. Yet, this study has shown that the percentage of English courses offered is the best predictor of the extent that a college emphasizes the liberal arts. If National Center for Educational Statistics were to add this to the reporting schedules, more meaningful and descriptive categories of community colleges could be devised.

Unfortunately, the chances that this new data would be collected are slim. Hence, the best fitting system that uses data that are already collected for all institutions would be #3, a simple categorization based on size alone. The accuracy of classification based on

percentage of the curriculum that is liberal arts is high for large colleges (93 percent accurate), while only 47 percent of the small to medium colleges are accurately classified. In accordance, if this system were to be followed, it would be more accurate to have the following categories: 1) Large, Liberal Arts Colleges and 2) Small to Medium Colleges (with a range of curricular emphases). The second category would include colleges that are both occupational and liberal arts. Because no accurate proxy has been identified to sort the colleges, the category should remain undivided.

## Chapter 8: Discussion of the Proposed Classification System

The proposed classification system will be discussed in terms of the theoretical issues that have been raised earlier in this paper. Lakoff's theoretical framework will be related to the study findings and to the proposed classification.

### Revisiting the Theoretical Framework

Returning to the review of the theory of classification and the work of George Lakoff, the following concepts will be discussed as applied to the present project: fuzziness and non-rigid boundaries; prototype and basic level effects and idealized cognitive models; and mapping the proposed categories.

*Fuzziness.* Contrary to classical theory of classification, real-life systems are not made up of objects with clearly defined boundaries. Community colleges are no exception. Curricular differences between community colleges can be understood along a continuum from those that are predominantly liberal arts oriented to those that are predominantly occupationally-oriented. No natural divisions along this continuum emerged when the descriptive statistics across institutions were analyzed. Similarly, in terms of institutional size, no break points naturally exist on which to base the categories of small, medium and large colleges.

In both the cases of curricular characteristics and institutional size, the fuzziness of the boundaries necessitated a seemingly random division to be imposed. The divisions, however, were not entirely random; they were based on principles of practicality and meaningfulness. As for institutional size, the dividing lines between

small, medium and large institutions were imposed by dividing the sample evenly into three groups. As for establishing the dividing lines for the extent of the curriculum devoted to the liberal arts, it seemed a meaningful division to divide colleges into those that cluster around the 50 percent level (from 40 to 60 percent) and those below that range and above that range. However, when this was tested, it was found that the proxies could not be used at this level of specificity. Thus, the proposed category of "comprehensive college," which included colleges with percentages of liberal arts from 40 to 60 percent, had to be abandoned. In a sense, there was too much fuzziness to create a category of colleges that had a balance between the liberal arts and occupational curriculum. Likewise, only for large community colleges could the curriculum characteristic of percentage of liberal arts be applied because for smaller institutions, the association between the proxies and the percentage of liberal arts courses was not strong enough on which to base classification.

*Prototype and Basic Level Effects and Idealized Cognitive Models.* The proposed categories for community colleges are influenced by the commonly-held idealized representation of higher education – that of the institution that emphasizes the teaching of the liberal arts. As such, the proposed categories are derived from the basic level category of higher education, the prototype college, and are thus congruent with general perceptions about higher education institutions. This is an important factor for the overall practicality of the classification system. If, for example, the categories of community colleges were designed around characteristics that had no connection to the idealized cognitive models of higher education – if colleges were categorized based on their

geographic location or on how long they had been in existence, for instance – the categories would be far removed from general impressions and intuitive distinctions of the general public.

*Mapping the Proposed Categories.* A graphic presentation of the proposed classification of community colleges is depicted below.

Figure 7. Graphic Presentation of the Proposed Classification of Community Colleges

Comparing this structure to that of the other Carnegie categories as illustrated in the literature review, the proposed categories and the chaining principles around which they are constructed are not dissimilar to that of the other Carnegie categories. As previously stated, no uniform structure of categories exists within the Carnegie Classification; the proposed categories for community colleges simply add curricular characteristics (in this case, course offerings as opposed to academic majors granted) as one more additional dimension upon which institutions are classified within the system. In fact, the model set forth for the classification of community colleges based on curricular characteristics may be one that could be utilized throughout the Carnegie

categories. Studies that consider the curriculum characteristics of other institutional types may reveal that the curriculum is a good basis for classification across all categories.

## Chapter 9: Conclusions and Implications

This project has addressed the need of a classification system for community colleges. The theoretical issues surrounding categories -- their design and their purpose -- have been discussed and applied to the current system of classification of higher education institutions. A myriad of possible approaches to classifying community colleges has been explored. Grounded in historical and contemporary research on the community college curriculum, a classification system has been proposed, which is based on college course offerings, in particular, the percentage of institutional course offerings that is in the liberal arts.

Classification theory describes how useful categories are in line with general perceptions of the objects being classified. When considering general perceptions of community colleges, however, some misperceptions endure that must not be allowed to influence category design. A long line of criticism, beginning with the work of Brint and Karabel (1989), rallies around the idea that community colleges shunt minority students into occupationally-oriented programs, diverting their aspirations away from transferring to a four-year institution. To refute this, however, findings from this and other studies have shown that the colleges with the greatest percentages of minority students are by-and-large the colleges with the greatest percentages of liberal arts in course offerings. The size of an institution positively correlates with the percentage of minority students enrolled. And data from the Center for the Study of Community Colleges' (1997) Transfer Assembly show that larger colleges more often have greater rates of transfer than smaller colleges. If minority students make up a greater percentage of the enrollment in

larger colleges than smaller colleges, and if, on the whole, larger colleges exhibit greater transfer rates than smaller colleges, then it becomes evident that minority students are not being tracked into occupationally-oriented institutions. All in all, a classification system grounded in the statistics of college enrollment and course offerings is on much more solid ground than one influenced by misperceptions that do not take into account the facts.

In closing, some last remarks are offered on classification in general, and on classification of community colleges in particular. Two vivid analogies are presented to underscore the fact that the design of categories is subject to the values of the designer. First, a classic scenario is relayed that illustrates that the purpose of a given classification system dictates the ultimate shape of the categories. And second, in order to show that the shape of categories is dependent on the purpose and the values of those who are constructing them, the issue of specificity of detail on which categories are constructed is explored through several analogies.

## Final Thoughts on Classification

In Hayakawa's classic text, Language in Thought and Action, originally published in 1939 and in multiple editions since, a scenario is posed to readers to bring home a point that has been emphasized in this paper – that, in Hayakawa's (1964) words, "What we call things and where we draw the line between one class of things and another depend upon the interests we have and the purposes of the classification" (p. 215). That scenario is worth reproducing here:

[Imagine] eight objects, let us say animals, four large and four small, a different four with round heads and another four with square heads, and still another four with curly tails and another four with straight tails. These animals, let us say, are scampering about your village, but since at first they are of no importance to you, you ignore them. You do not even give them a name.

One day, however, you discover that the little ones eat up your grain, while the big ones do not. A differentiation sets itself up, and abstracting the common characteristics of A, B, C, and D, you decide to call these gogo; E, F, G, and H you decide to call gigi. You chase away the gogo, but leave the gigi alone. Your neighbor, however, has had a different experience; he finds that those with square heads bite, while those with round heads do not. Abstracting the common characteristics of B, D, F, and H, he calls them daba, and A, C, E, and G he calls dobo. Still another neighbor discovers, on the other hand, that those with curly tails kill snakes, while those with straight tails do not. He differentiates them, abstracting still another set of common characteristics: A, B, E, and F are busa, while C, D, G, and H are busana.

Now imagine that the three of you are together when E runs by. You say, "There goes the gigi"; your first neighbor says, "There goes the dobo"; your other neighbor says, "There goes the busa." Here immediately a great controversy arises. What is it really, a gigi, a dobo, or a busa? What is its *right name*?

In conclusion to this scenario, Hayakawa reassures the readers that no one classification is any more final than any other and that each is useful for its own purpose. This message is fundamental to the present project -- the proposed classification system is not the only way to classify community colleges. It is one, however, that fits well with the mission of the institutional type and with the general public's understanding of what the community college is about.

Just as the purpose of the classification is central to the ultimate shape of the categories, the purpose is also central to the degree of specificity on which a given object is analyzed for classification. Several analogies are offered below to illustrate this point.

How long is the coastline of California? A cursory look at a map may result in one estimate of the length of the coast, but as one accounts for the harbors and ports, even the small twists and turns of rocks and beach, the length of the coast will vary by the degree of specificity by which it is measured. Hayakawa applies a different example to illustrate the same point:

> Many of us, for example, cannot distinguish between pickerel, pike, salmon, smelts, perch, crappies, halibut, and mackerel; we say that they are "just fish, and I don't like fish." To a seafood connoisseur, however, these distinctions are real, since they mean the difference to him between one kind of good meal, a very different kind of good meal, or a poor meal. To a zoologist, even finer distinctions become of great importance, since he has other and more general ends in view (p. 216).

The same situation as in the above examples is confronted in setting up a classification system for community colleges. It is the nature of classification to generalize across individual cases, but the degree of that generalization can vary based on one's perspective of what details are important. Moreover, the degree of detail viewed as important may also be a function of the value placed on the object to begin with. In the coastline example, a sailor or ship captain highly values a very detailed map of the coastline for his or her safety and livelihood. However, tourists who are sightseeing along Highway 1 are not that concerned with the craggy outcroppings or rocky promontories, except maybe to take a nice photograph. Similarly, in the fish example, a connoisseur and a zoologist highly value the differences between the fish more than the general public for their special purposes. Not unlike these examples, those who highly value the educational offerings and services of the community college would likely find that a more detailed classification system -- which highlights the uniquenesses between institutions -- is more useful and informative.

This project has not been about proposing an entirely new system of classifying institutions of higher education. Rather, it has been about elaborating on the existing classification system. Another worthy project would have been a critique and proposed overhaul of the existing classification system. However, I have chosen instead to add to the awareness of why the present system is constructed the way it is. This awareness opens the door for revision of the system, and specifically, to allow for greater specificity and attention to be given to an often marginalized institution within the hierarchical categorization system of higher education, the community college.

Classification, even a faulty or inadequate one, is useful. The project of revising the classification of community colleges would not have been proposed if a current classification of the system of higher education did not already exist. Thus, classification schemes stretch one's cognitive understanding of the classified objects, allowing perspectives that might not otherwise have been explored.

Many expectations can exist about objects within a classification system. And in cases when one's expectations may not mesh with those by which objects are classified, Cooley (1976) explains that it is easier to revise a classification to bring it in line with one's expectations than it is to align one's expectations with individual cases.

Lastly, classifications can always be improved upon and refined. In fact, the failure to fit objects within a classification system fuels revision. It is my sincere hope that the proposed categories of community colleges will further the refinement of the Carnegie Classification of higher education institutions. Let it be one step in a long process of improvement.

Appendices

Appendix A

Letter Requesting Participation

November 27, 1997

The Center for the Study of Community Colleges at the University of California, Los Angeles, is preparing to update the national survey of community college curriculum that it has conducted several times in prior years. In order to do this, we need your college's course catalog and schedule of classes for the 1998 spring term.

Please send them to:

Gwyer Schuyler
ERIC Clearinghouse for Community Colleges
UCLA
3051 Moore Hall, Box 951521
Los Angeles, CA 90095-1521

Thank you,

Arthur M. Cohen
Director

April 29, 1998

To the Office of the President:

Several months ago, we requested and received a course catalog and schedule from your institution to be included in our national survey of community college curriculum. The study, which has been conducted periodically since the 1970s, involves the coding of courses offered so that assessments can be made about nationwide changes in the community college curriculum. Another component of this study is to look at the student enrollment figures for certain courses.

Your college has been randomly selected to be included in this study. **In order to complete our analysis of student enrollments across the curriculum, we are requesting a printout of your institution's student class enrollment figures for the 1998 spring semester.** This enrollment data will be used to extrapolate total enrollment figures nationwide.

It is crucial to our study that we receive this information as soon as possible. Because of changes being faced by community colleges nationwide, such as increased enrollments and new policies such as welfare-to-work, this work is important to understand the broader trends of the community college curriculum. We will be publishing the findings in a number of journals and summaries will be sent out to each college that is in the research sample.

**Please mail your institution's student class enrollment figures for Spring 1998 (in either hardcopy format or on disk) along with a name, address, and telephone number of the appropriate contact person to:**

Gwyer Schuyler
ERIC Clearinghouse for Community Colleges
UCLA
3051 Moore Hall, Box 951521
Los Angeles, CA 90095-1521

We would like to thank you for your cooperation. If there are any questions regarding the project, please direct them to Gwyer Schuyler, Project Coordinator, at 310/206-1200 or schuyler@ucla.edu.

Sincerely,

Arthur M. Cohen
Director

Appendix B

Sample Colleges

ADIRONDACK COMMUNITY COLLEGE, QUEENSBURY, NY

ALLEGANY COLLEGE, CUMBERLAND, MD

AMERICAN RIVER COLLEGE, SACRAMENTO, CA

ANGELINA COLLEGE, LUFKIN, TX

ANSON COMMUNITY COLLEGE, POLKTON, NC

BAKERSFIELD COLLEGE, BAKERSFIELD, CA

BERGEN COMMUNITY COLLEGE, PARAMUS, NJ

BISMARCK STATE COLLEGE, BISMARCK, ND

BLADEN COMMUNITY COLLEGE, DUBLIN, NC

BLINN COLLEGE, BRENHAM, TX

BOSSIER PARISH COMMUNITY COLLEGE, BOSSIER CITY, LA

BREVARD COMMUNITY COLLEGE, COCOA, FL

BURLINGTON COUNTY COLLEGE, PEMBERTON, NJ

CABRILLO COLLEGE, APTOS, CA

CAPE FEAR COMMUNITY COLLEGE, WILMINGTON, NC

CAPITAL COMMUNITY-TECHNICAL COLLEGE, HARTFORD, CT

CASPER COLLEGE, CASPER, WY

CATAWBA VALLEY COMMUNITY COLLEGE, HICKORY, NC

CATONSVILLE COMMUNITY COLLEGE, CATONSVILLE, MD

CENTRAL ARIZONA COLLEGE, COOLIDGE, AZ

CENTRAL OREGON COMMUNITY COLLEGE, BEND, OR

CERRITOS COLLEGE, NORWALK, CA

CERRO COSO COMMUNITY COLLEGE, RIDGECREST, CA

CISCO JUNIOR COLLEGE, CISCO, TX

CITY COLLEGES OF CHICAGO-RICHARD J DALEY COLLEGE, CHICAGO, IL

CITY COLLEGES OF CHICAGO-WILBUR WRIGHT COLLEGE, CHICAGO, IL

CLARENDON COLLEGE, CLARENDON, TX

CLEVELAND STATE COMMUNITY COLLEGE, CLEVELAND, TN

COAHOMA COMMUNITY COLLEGE, CLARKSDALE, MS

COASTAL CAROLINA COMMUNITY COLLEGE, JACKSONVILLE, NC

COCHISE COLLEGE, DOUGLAS, AZ

COFFEYVILLE COMMUNITY COLLEGE, COFFEYVILLE, KS

COLLEGE OF THE DESERT, PALM DESERT, CA

COLLEGE OF THE SEQUOIAS, VISALIA, CA

COLORADO NORTHWESTERN COMMUNITY COLLEGE, RANGELY, CO

COMMUNITY COLLEGE OF ALLEGHENY COUNTY, PITTSBURGH, PA

COMMUNITY COLLEGE OF SOUTHERN NEVADA, LAS VEGAS, NV

COMMUNITY COLLEGE OF VERMONT, WATERBURY, VT

CONTRA COSTA COLLEGE, SAN PABLO, CA

CORNING COMMUNITY COLLEGE, CORNING, NY

CRAVEN COMMUNITY COLLEGE, NEW BERN, NC

CUMBERLAND COUNTY COLLEGE, VINELAND, NJ

CUNY BRONX COMMUNITY COLLEGE, BRONX, NY

DEL MAR COLLEGE, CORPUS CHRISTI, TX

DELGADO COMMUNITY COLLEGE, NEW ORLEANS, LA

DELTA COLLEGE, UNIVERSITY CENTER, MI

DES MOINES COMMUNITY COLLEGE, ANKENY, IA

DODGE CITY COMMUNITY COLLEGE, DODGE CITY, KS

DURHAM TECHNICAL COMMUNITY COLLEGE, DURHAM, NC

EASTERN ARIZONA COLLEGE, THATCHER, AZ

EASTERN IOWA COMMUNITY COLLEGE DISTRICT, DAVENPORT, IA

EASTERN WYOMING COLLEGE, TORRINGTON, WY

EASTFIELD COLLEGE, MESQUITE, TX

EDGECOMBE COMMUNITY COLLEGE, TARBORO, NC

EL CAMINO COLLEGE, TORRANCE, CA

EL CENTRO COLLEGE, DALLAS, TX

EL PASO COMMUNITY COLLEGE, EL PASO, TX

ERIE COMMUNITY COLLEGE-NORTH CAMPUS, WILLIAMSVILLE, NY

FLORENCE DARLINGTON TECHNICAL COLLEGE, FLORENCE, SC

FULLERTON COLLEGE, FULLERTON, CA

GOGEBIC COMMUNITY COLLEGE, IRONWOOD, MI

HALIFAX COMMUNITY COLLEGE, WELDON, NC

HARFORD COMMUNITY COLLEGE, BEL AIR, MD

HARRISBURG AREA COMMUNITY COLL.-HARRISBURG, HARRISBURG, PA

HAWKEYE COMMUNITY COLLEGE, WATERLOO, IA

HAZARD COMMUNITY COLLEGE, HAZARD, KY

HERKIMER COUNTY COMMUNITY COLLEGE, HERKIMER, NY

IMPERIAL VALLEY COLLEGE, IMPERIAL, CA

INDEPENDENCE COMMUNITY COLLEGE, INDEPENDENCE, KS

IOWA LAKES COMMUNITY COLLEGE, ESTHERVILLE, IA

IOWA WESTERN COMMUNITY COLLEGE, COUNCIL BLUFF, IA

IVY TECH STATE COLLEGE-LAFAYETTE, LAFAYETTE, IN

IVY TECH STATE COLLEGE-NORTH CENTRAL, SOUTH BEND, IN

J SARGEANT REYNOLDS COMMUNITY COLLEGE, RICHMOND, VA

JEFFERSON COMMUNITY COLLEGE, STEUBENVILLE, OH

JOHNSON COUNTY COMMUNITY COLLEGE, OVERLAND PARK, KS

KALAMAZOO VALLEY COMMUNITY COLLEGE, KALAMAZOO, MI

KANSAS CITY KANSAS COMMUNITY COLLEGE, KANSAS CITY, KS

KENNEBEC VALLEY TECHNICAL COLLEGE, FAIRFIELD, ME

KIRKWOOD COMMUNITY COLLEGE, CEDAR RAPIDS, IA

LAKE MICHIGAN COLLEGE, BENTON HARBOR, MI

LARAMIE COUNTY COMMUNITY COLLEGE, CHEYENNE, WY

LAREDO COMMUNITY COLLEGE, LAREDO, TX

LEEWARD COMMUNITY COLLEGE, PEARL CITY, HI
LEWIS AND CLARK COMMUNITY COLLEGE, GODFREY, IL
LORD FAIRFAX COMMUNITY COLLEGE, MIDDLETOWN, VA
LOS ANGELES HARBOR COLLEGE, WILMINGTON, CA
LOS ANGELES SOUTHWEST COLLEGE, LOS ANGELES, CA
LOS ANGELES TRADE TECHNICAL COLLEGE, LOS ANGELES, CA
MADISON AREA TECHNICAL COLLEGE, MADISON, WI
MIDDLESEX COMMUNITY-TECHNICAL COLLEGE, MIDDLETOWN, CT
MIDLAND COLLEGE, MIDLAND, TX
MISSION COLLEGE, SANTA CLARA, CA
MISSISSIPPI COUNTY COMMUNITY COLLEGE, BLYTHEVILLE, AR
MOHAWK VALLEY COMMUNITY COLLEGE, UTICA, NY
MONROE COMMUNITY COLLEGE, ROCHESTER, NY
MONTCALM COMMUNITY COLLEGE, SIDNEY, MI
MOUNT WACHUSETT COMMUNITY COLLEGE, GARDNER, MA
NASH COMMUNITY COLLEGE, ROCKY MOUNT, NC
NEOSHO COUNTY COMMUNITY COLLEGE, CHANUTE, KS
NORTH CENTRAL MISSOURI COLLEGE, TRENTON, MO
NORTH CENTRAL TEXAS COLLEGE, GAINESVILLE, TX
NORTH COUNTRY COMMUNITY COLLEGE, SARANAC LAKE, NY
NORTH IOWA AREA COMMUNITY COLLEGE, MASON CITY, IA
NORTHCENTRAL TECHNICAL COLLEGE, WAUSAU, WI
NORTHEAST IOWA COMMUNITY COLLEGE-CALMAR, CALMAR, IA
NORTHERN MAINE TECHNICAL COLLEGE, PRESQUE ISLE, ME
NORTHLAND PIONEER COLLEGE, HOLBROOK, AZ
NORTHWEST ARKANSAS COMMUNITY COLLEGE, BENTONVILLE, AR
NORTHWESTERN CT. COMMUNITY-TECHNICAL COLL, WINSTED, CT
OCEAN COUNTY COLLEGE, TOMS RIVER, NJ
ORANGE COUNTY COMMUNITY COLLEGE, MIDDLETOWN, NY

ORANGEBURG CALHOUN TECHNICAL COLLEGE, ORANGEBURG, SC
PALOMAR COLLEGE, SAN MARCOS, CA
PARADISE VALLEY COMMUNITY COLLEGE, PHOENIX, AZ
PARIS JUNIOR COLLEGE, PARIS, TX
PASADENA CITY COLLEGE, PASADENA, CA
PASSAIC COUNTY COMMUNITY COLLEGE, PATERSON, NJ
PATRICK HENRY COMMUNITY COLLEGE, MARTINSVILLE, VA
PIEDMONT COMMUNITY COLLEGE, ROXBORO, NC
PRINCE GEORGES COMMUNITY COLLEGE, LARGO, MD
RIVERSIDE COMMUNITY COLLEGE, RIVERSIDE, CA
ROXBURY COMMUNITY COLLEGE, ROXBURY CROSSING, MA
SACRAMENTO CITY COLLEGE, SACRAMENTO, CA
SAINT JOHNS RIVER COMMUNITY COLLEGE, PALATKA, FL
SAINT LOUIS COMMUNITY COLLEGE-FOREST PARK, ST LOUIS, MO
SAINT PETERSBURG JUNIOR COLLEGE, PINELLAS PARK, FL
SAMPSON COMMUNITY COLLEGE, CLINTON, NC
SAN BERNARDINO VALLEY COLLEGE, SAN BERNARDINO, CA
SAN DIEGO CITY COLLEGE, SAN DIEGO, CA
SAN JUAN COLLEGE, FARMINGTON, NM
SCHENECTADY COUNTY COMMUNITY COLLEGE, SCHENECTADY, NY
SHAWNEE COMMUNITY COLLEGE, ULLIN, IL
SHELBY STATE COMMUNITY COLLEGE, MEMPHIS, TN
SKYLINE COLLEGE, SAN BRUNO, CA
SOUTH ARKANSAS COMMUNITY COLLEGE, EL DORADO, AR
SOUTH MOUNTAIN COMMUNITY COLLEGE, PHOENIX, AZ
SOUTHEAST COMMUNITY COLLEGE, CUMBERLAND, KY
SOUTHWEST MISSISSIPPI COMMUNITY COLLEGE, SUMMIT, MS
SOUTHWEST WISCONSIN TECHNICAL COLLEGE, FENNIMORE, WI
SPARTANBURG TECHNICAL COLLEGE, SPARTANBURG, SC

ST CLAIR COUNTY COMMUNITY COLLEGE, PORT HURON, MI
STATE TECHNICAL INSTITUTE AT MEMPHIS, MEMPHIS, TN
SUFFOLK CTY. COMMUNITY COLL.-WESTERN CAMPUS, BRENTWOOD, NY
SUSSEX COUNTY COMMUNITY COLLEGE, NEWTON, NJ
TECHNICAL COLLEGE OF THE LOWCOUNTRY, BEAUFORT, SC
THOMAS NELSON COMMUNITY COLLEGE, HAMPTON, VA
VICTOR VALLEY COLLEGE, VICTORVILLE, CA
VIRGINIA HIGHLANDS COMMUNITY COLLEGE, ABINGDON, VA
WALTERS STATE COMMUNITY COLLEGE, MORRISTOWN, TN
WAUBONSEE COMMUNITY COLLEGE, SUGAR GROVE, IL
WAUKESHA COUNTY TECHNICAL COLLEGE, PEWAUKEE, WI
WEST HILLS COMMUNITY COLLEGE, COALINGA, CA
WEST LOS ANGELES COLLEGE, CULVER CITY, CA
WEST VIRGINIA NORTHERN COMMUNITY COLLEGE, WHEELING, WV
WESTERN IOWA TECH COMMUNITY COLLEGE, SIOUX CITY, IA
WESTERN NEBRASKA COMMUNITY COLLEGE, SCOTTSBLUFF, NE
WESTERN OKLAHOMA STATE COLLEGE, ALTUS, OK
WESTERN PIEDMONT COMMUNITY COLLEGE, MORGANTON, NC
WESTERN WYOMING COMMUNITY COLLEGE, ROCK SPRINGS, WY
WILLIAM RAINEY HARPER COLLEGE, PALATINE, IL
WOR-WIC COMMUNITY COLLEGE, SALISBURY, MD
YAVAPAI COLLEGE, PRESCOTT, AZ
YUBA COLLEGE, MARYSVILLE, CA

Appendix D

Coding Tally Sheet

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Coding Tally Sheet Continued

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